8 Sheet Drawings

501.39082X00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): S. UNO, et al

Serial No.: 09/646,671

Filed: September 20, 2000

For: MANUFACTURING METHOD OF SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Group:

Examiner:

PROPOSED AMENDMENT TO THE DRAWINGS

Commissioner for Patents
Washington, D.C. 20231

April 5, 2001

Sir:

It is proposed that the drawings in the above-identified application be amended in accordance with the attached red-lined print, and approval of these drawing corrections is respectfully requested at this time.

Upon receipt of the approval of the amendment to the drawings and receipt of the official Notice of Allowance, the drawing amendments will be effected in accordance with the new procedures set forth in 1017 OG 4.

Respectfully submitted,

William I. Solomon
Registration No. 28,565
ANTONELLI, TERRY, STOUT & KRAUS, LLP

WIS/DRA/cee
Attachment(s)
(703) 312-6600

FIG. 1

FIG. 1 (a)

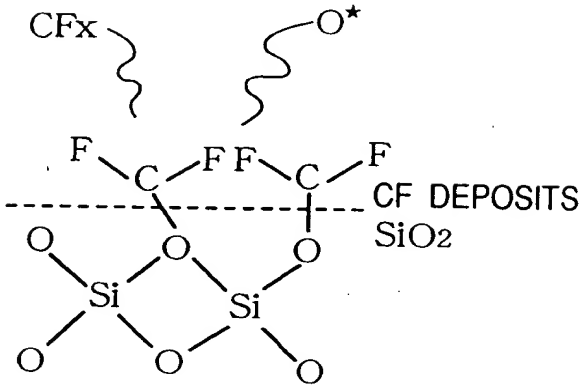


FIG. 1 (b)

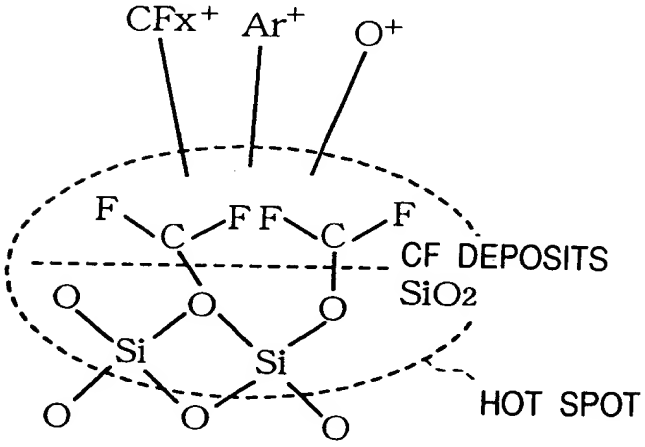
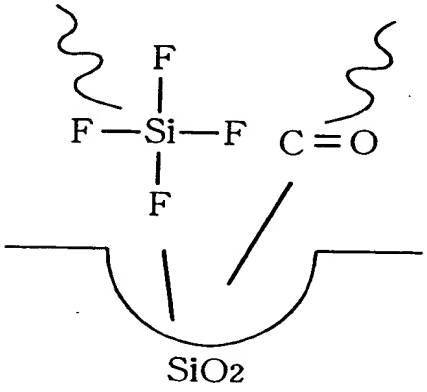


FIG. 1 (c)



~~FIG. 2~~

FIG. 2 (a)

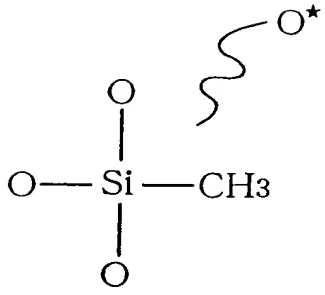


FIG. 2 (b)

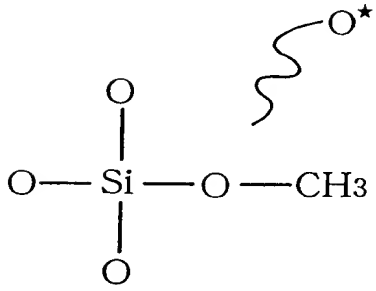
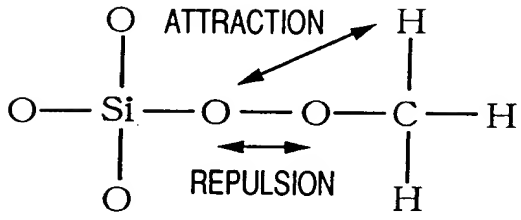
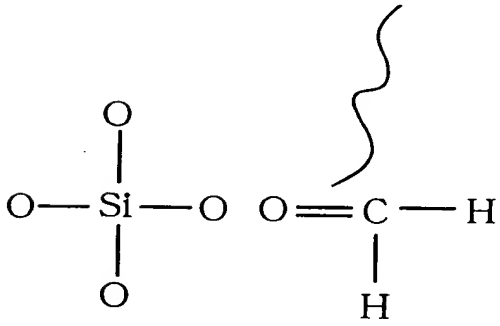


FIG. 2 (c)



METASTABLE STRUCTURE

FIG. 2 (d)



DECOMPO-SITION → VAPOR-IZATION

FIG. 3(a)

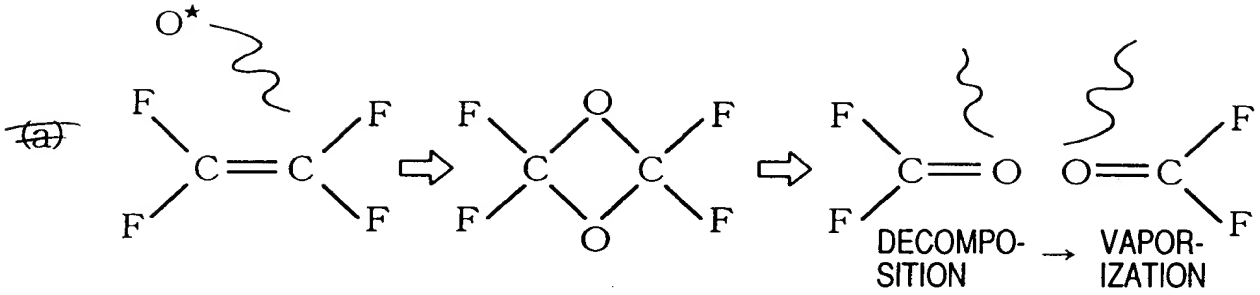


FIG. 3(b)

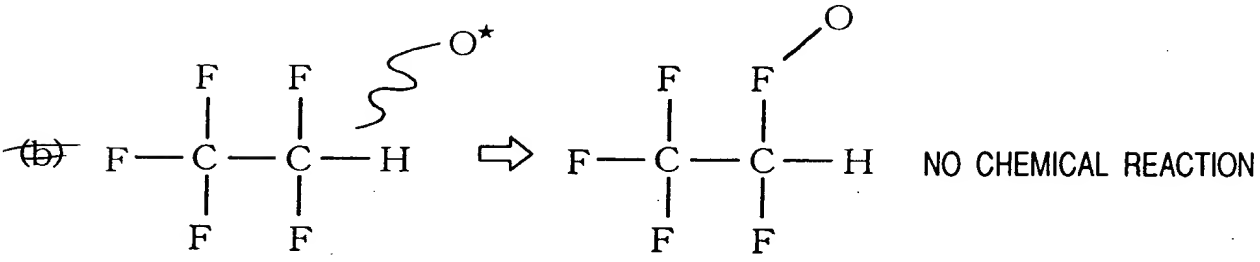
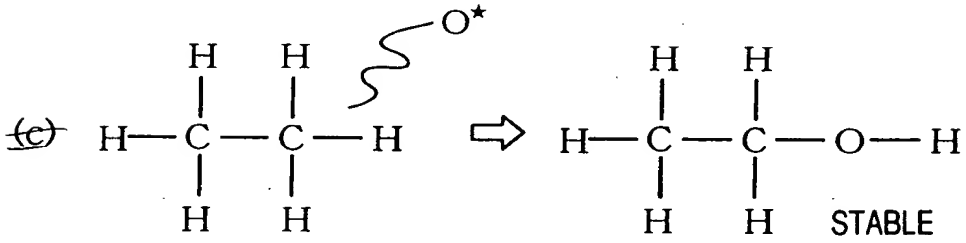


FIG. 3(c)



~~FIG. 4~~

FIG.4 (a)

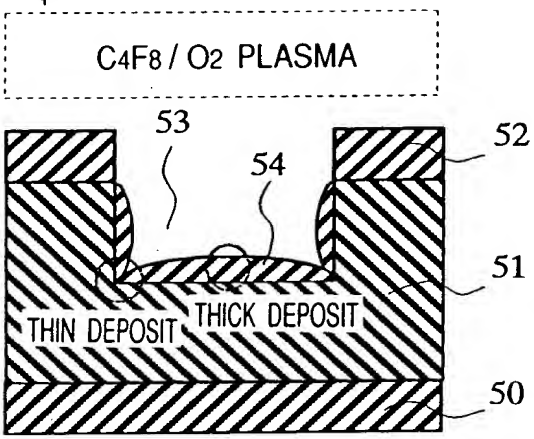


FIG.4 (b)

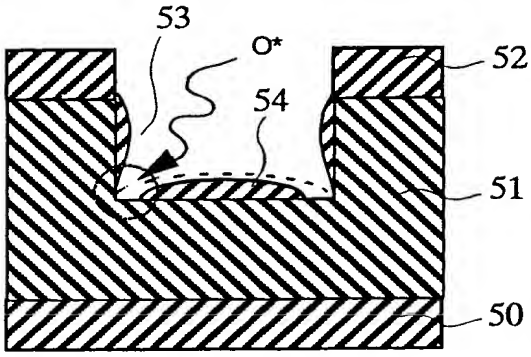


FIG.4 (c)

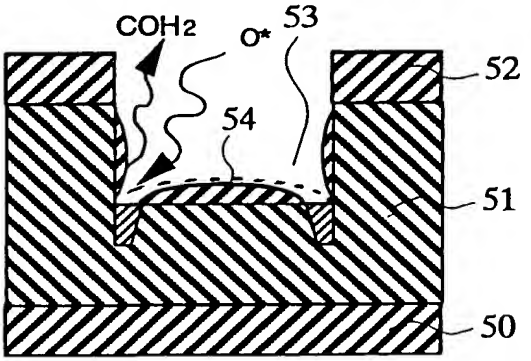


FIG.4 (d)

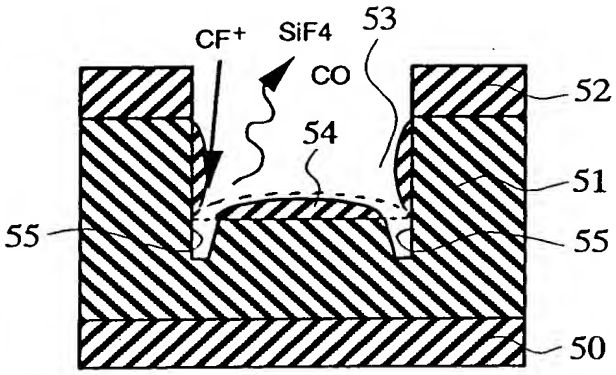
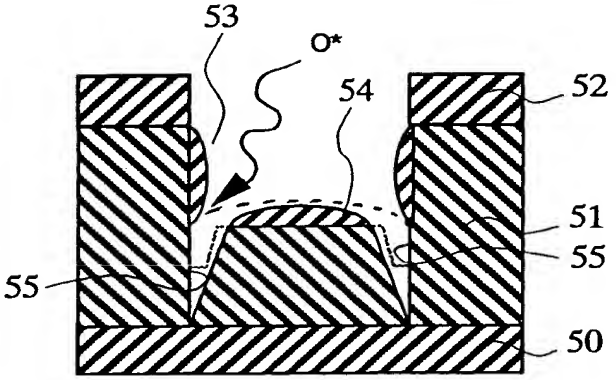


FIG.4 (e)



~~FIG. 5~~

FIG. 5 (a)

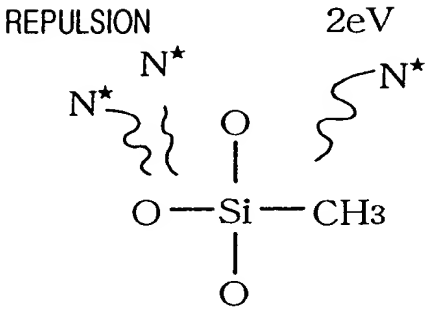


FIG. 5 (b)

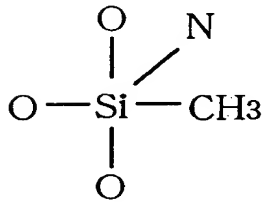
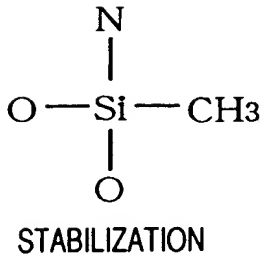


FIG. 5 (c)



~~FIG. 6~~

FIG. 6 (a)

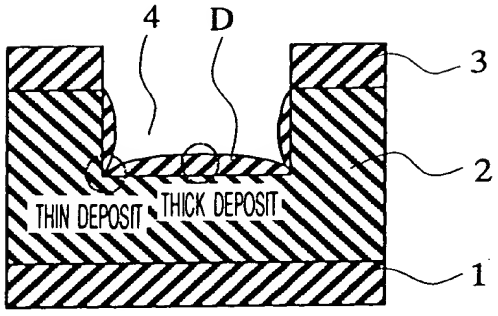
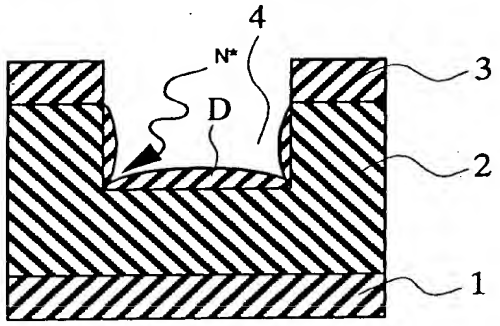


FIG. 6 (b)



1: INSULATING FILM
2: ORGANIC INSULATING FILM
3: PHOTORESIST FILM
4: RECESS

FIG. 6 (c)

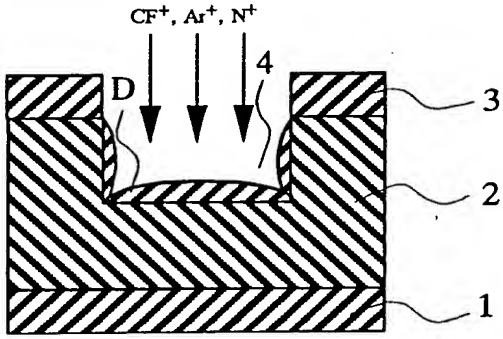
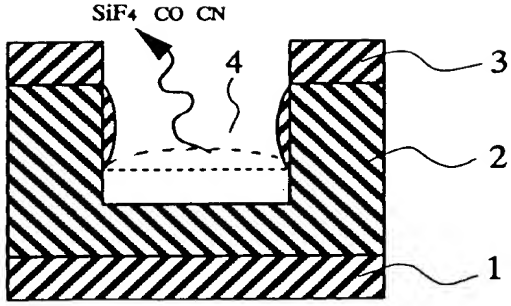


FIG. 6 (d)



~~FIG. 15~~

FIG. 15 (a)

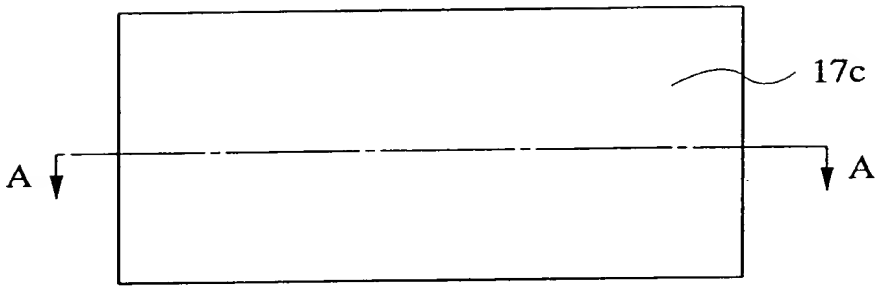
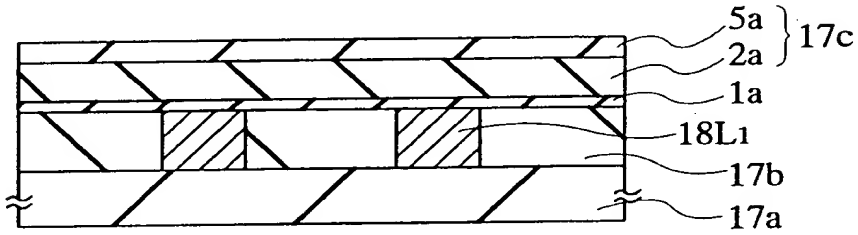


FIG. 15 (b)



~~FIG. 16~~

FIG. 16 (a)

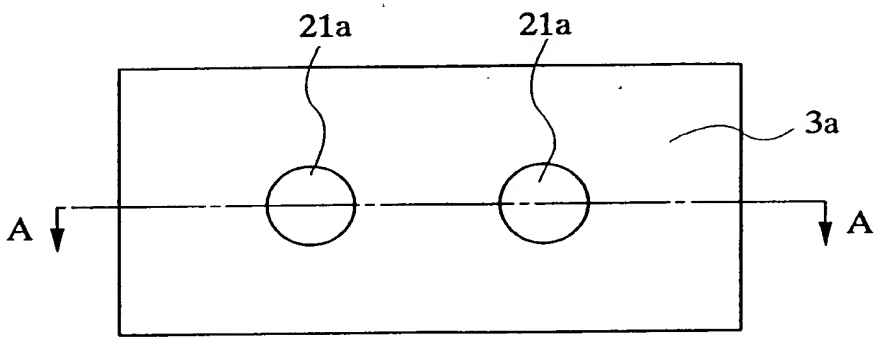
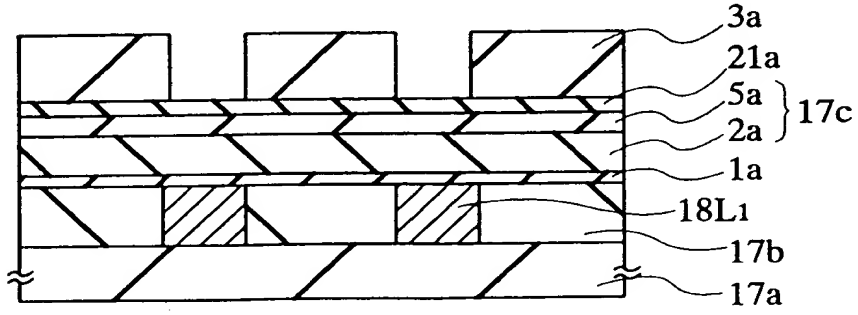


FIG. 16 (b)



~~FIG. 17~~

FIG. 17 (a)

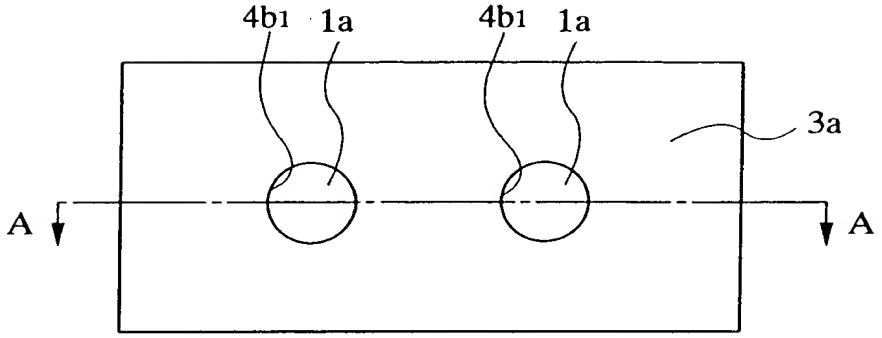
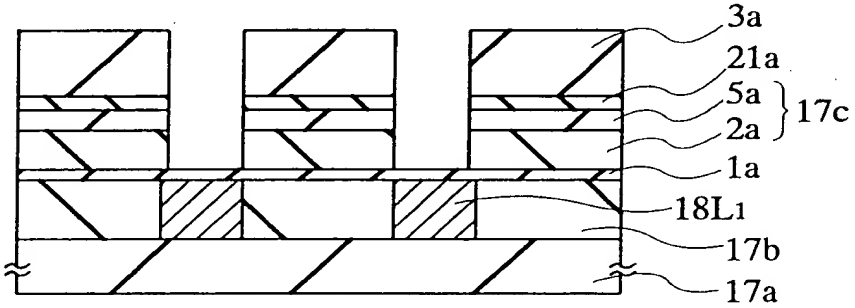


FIG. 17 (b)



~~FIG. 18~~

FIG. 18 (a)

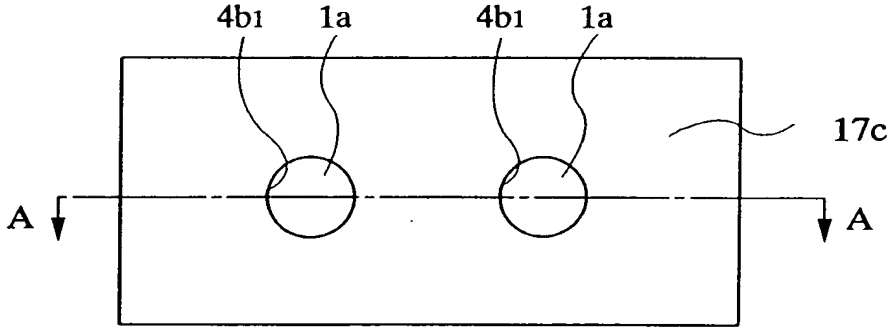
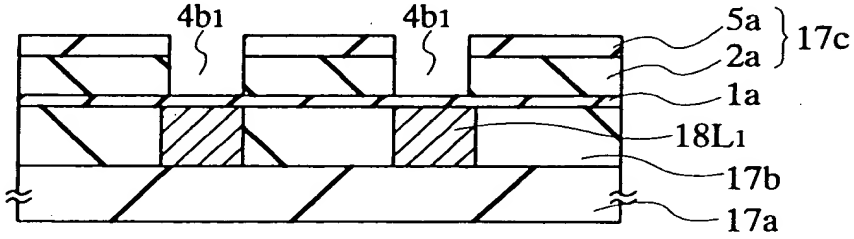


FIG. 18 (b)



~~FIG. 19~~

FIG. 19 (a)

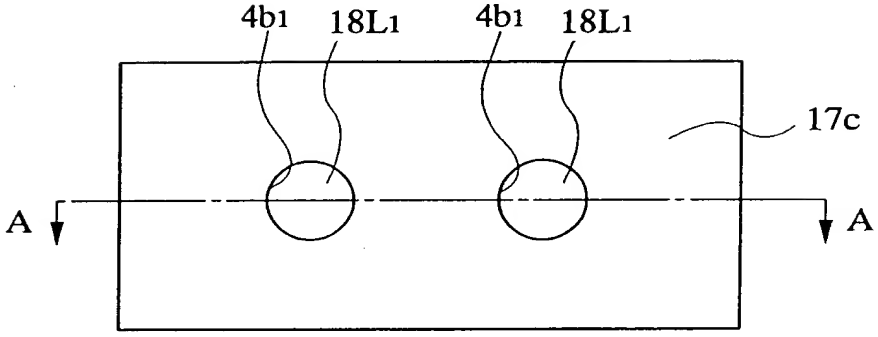
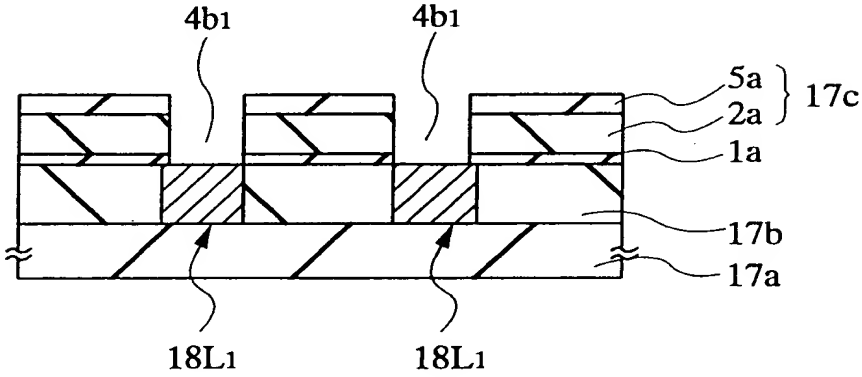


FIG. 19 (b)



~~FIG. 20~~

FIG.20(a)

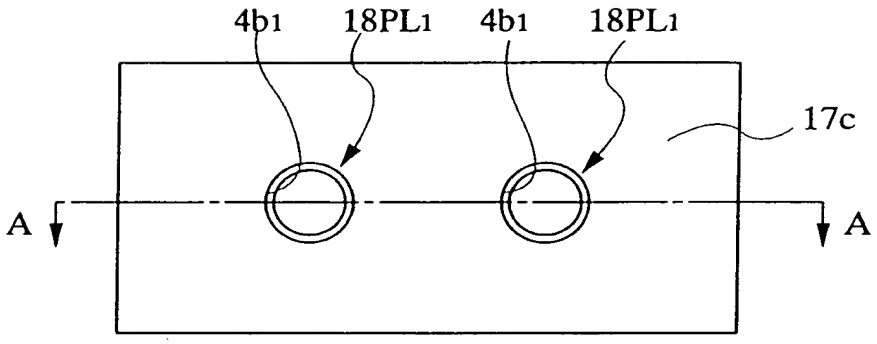
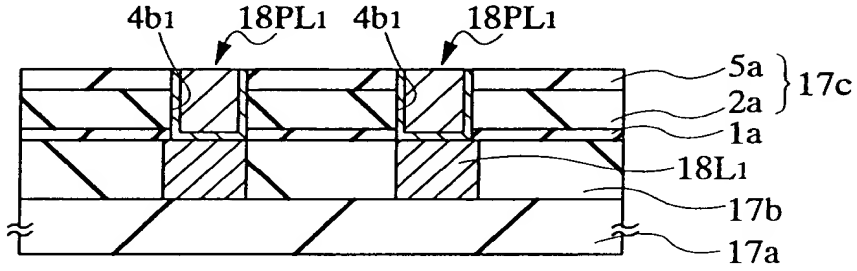


FIG20(b)



~~FIG. 21~~

FIG.21(a)

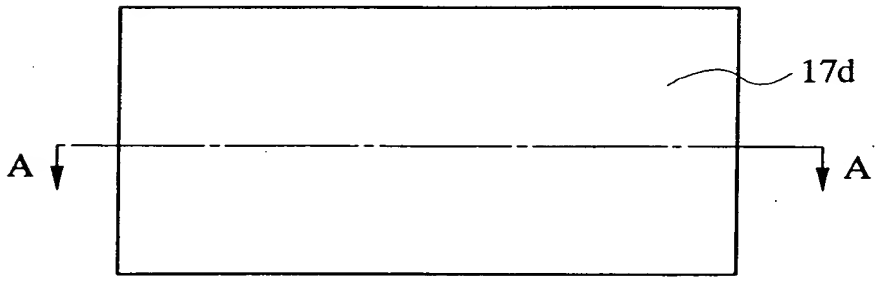
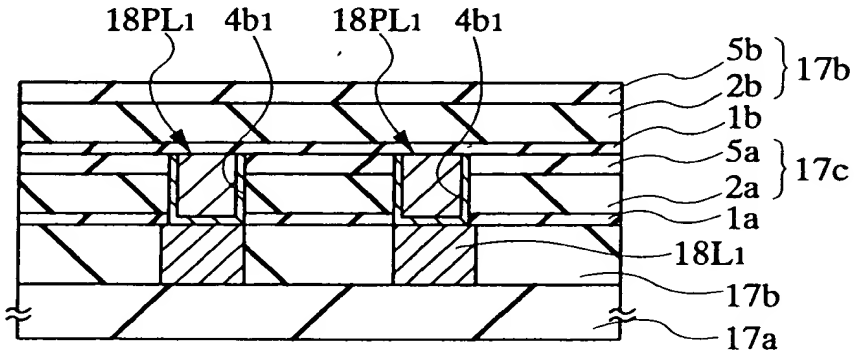


FIG21(b)



~~FIG. 22~~

FIG.22(a)

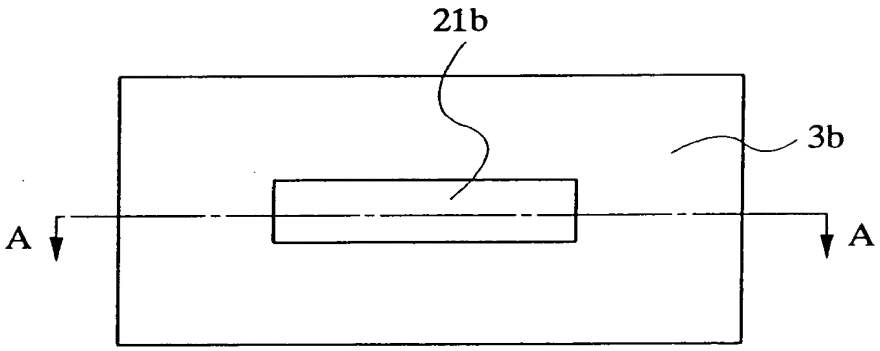
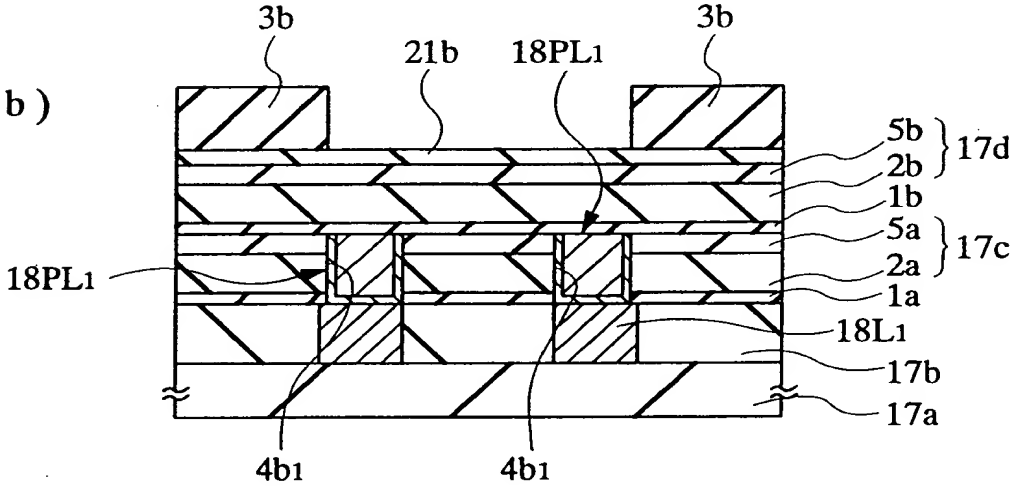


FIG.22(b)



~~FIG. 23~~

FIG. 23(a)

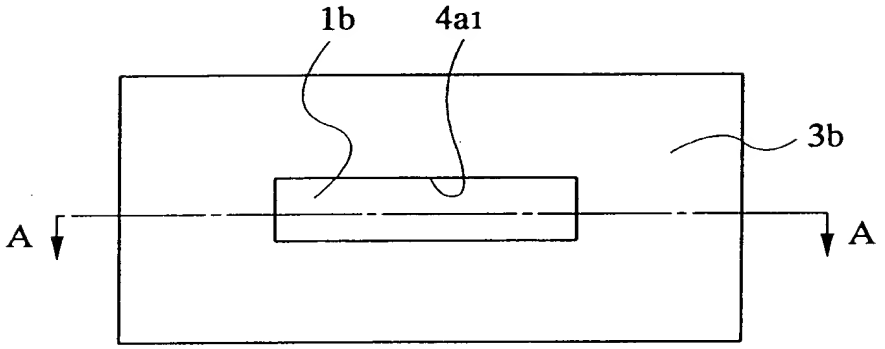
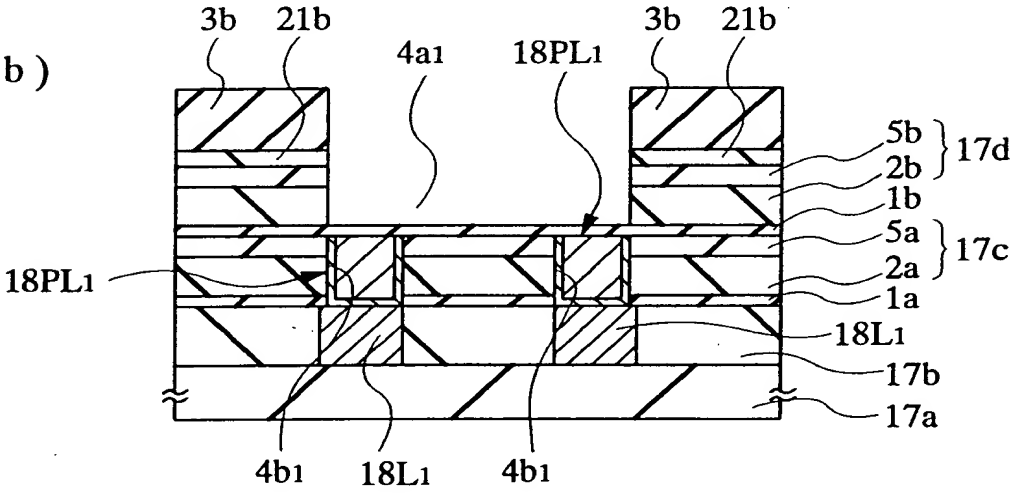


FIG 23(b)



~~FIG. 24~~

FIG. 24(a)

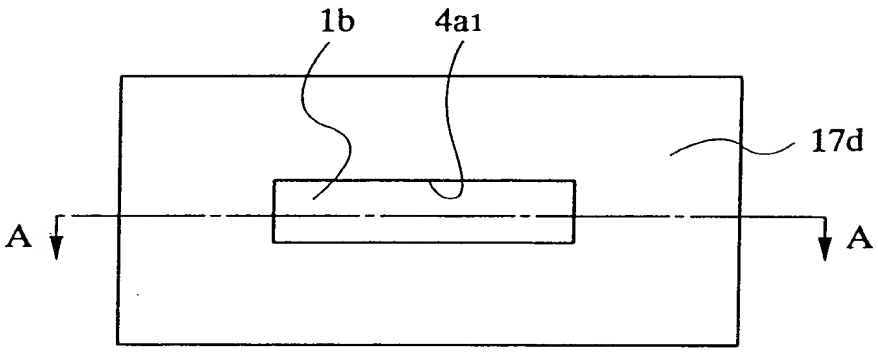
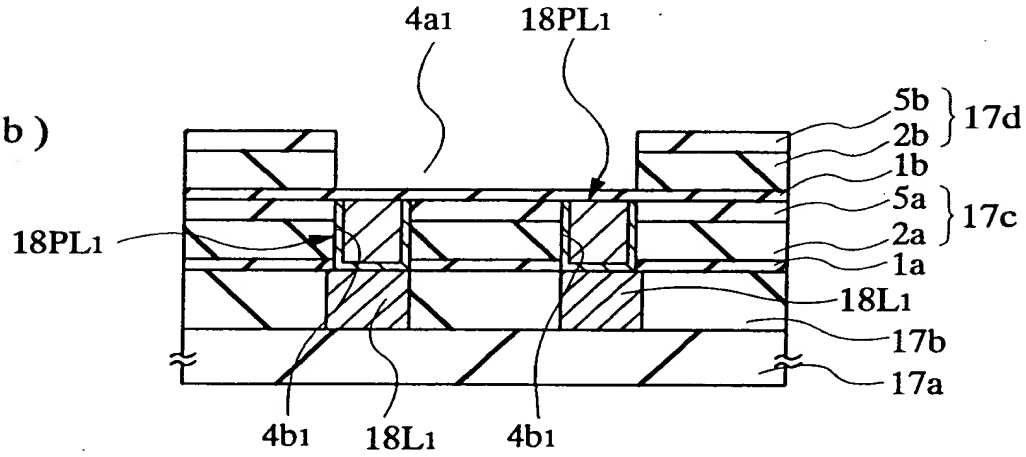


FIG. 24(b)



~~FIG. 25~~

FIG.25(a)

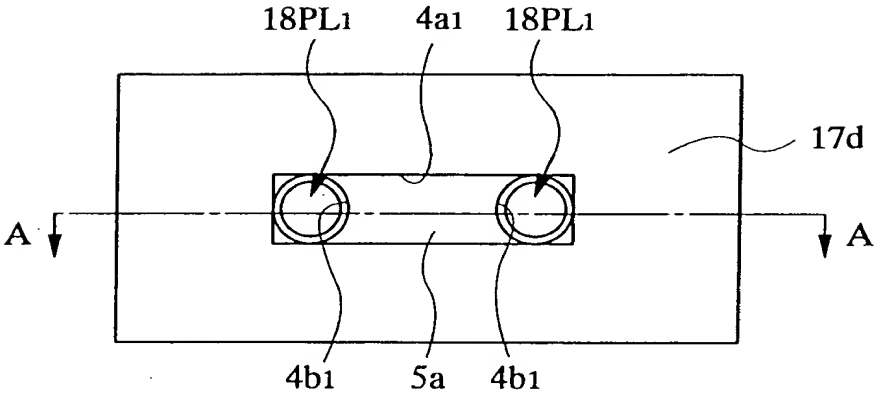
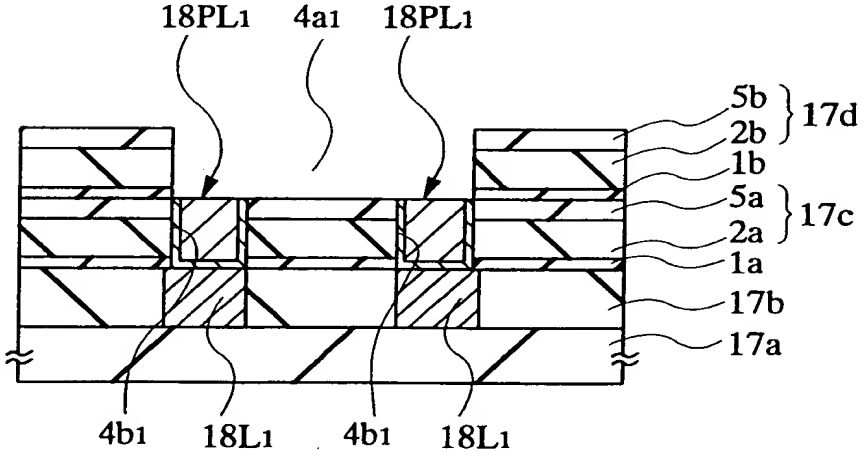


FIG.25(b)



~~FIG. 26~~

FIG. 26 (a)

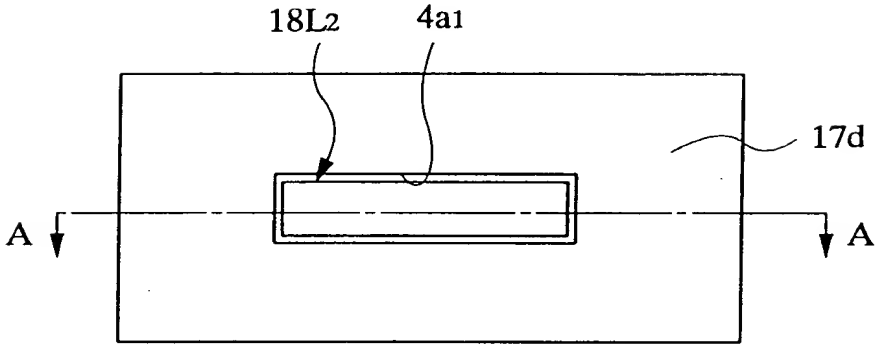


FIG. 26 (b)

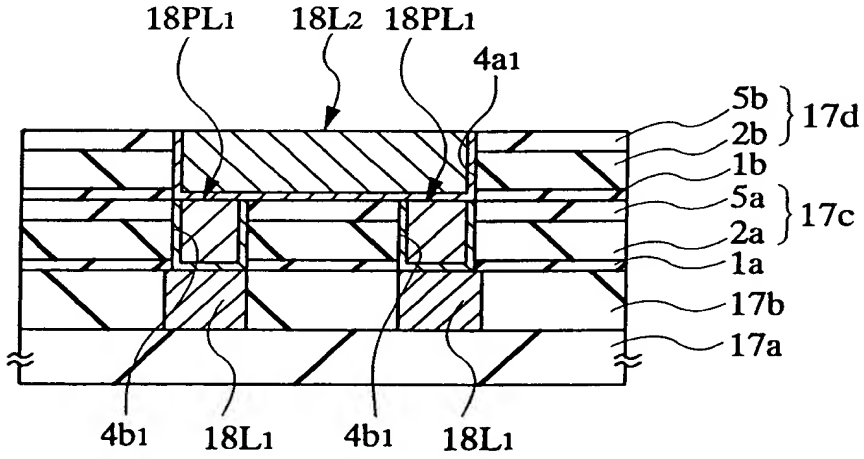


FIG. 27

FIG. 27 (a)

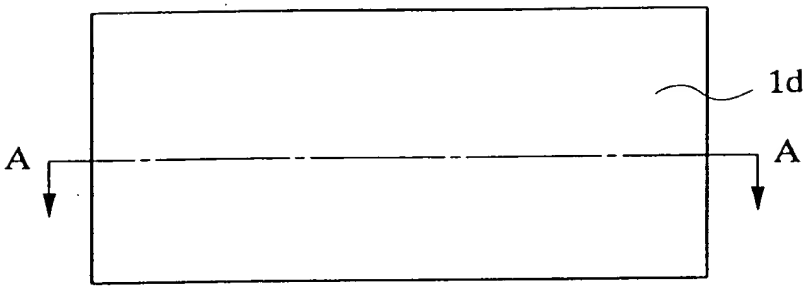


FIG. 27(b)

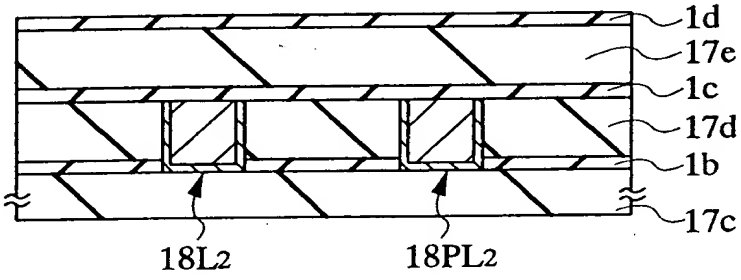


FIG. 28

FIG. 28 (a)

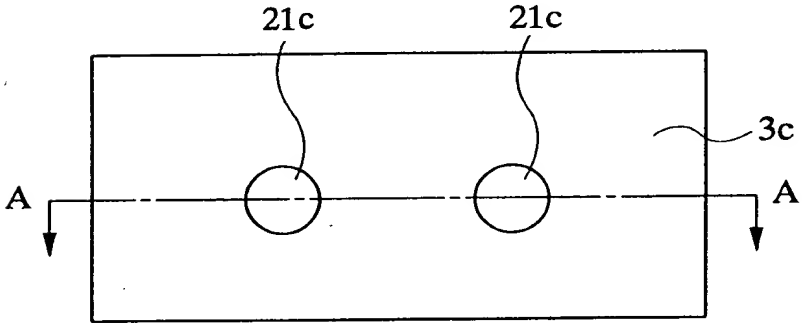
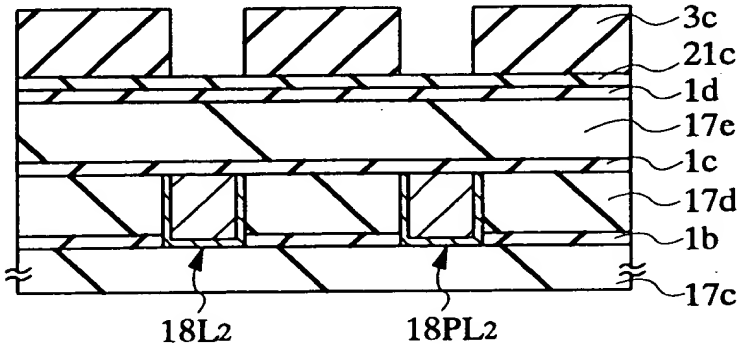


FIG. 28 (b)



~~FIG. 29~~

FIG. 29 (a)

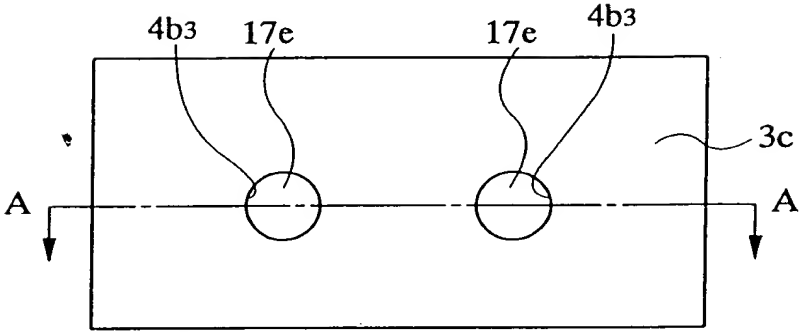
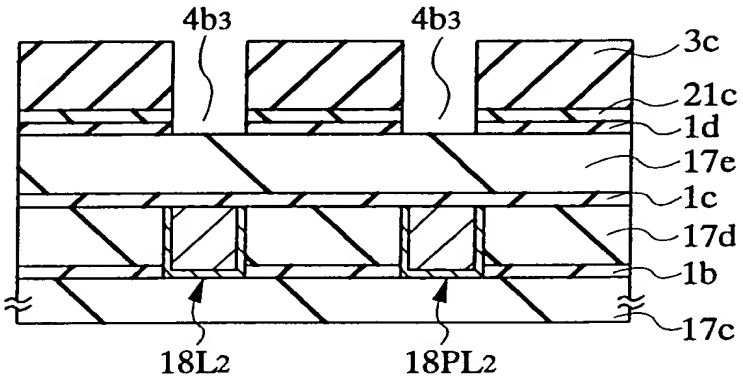


FIG. 29 (b)



~~FIG. 30~~

FIG. 30 (a)

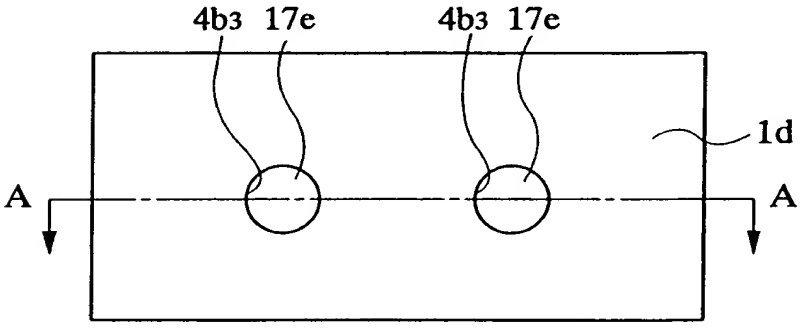
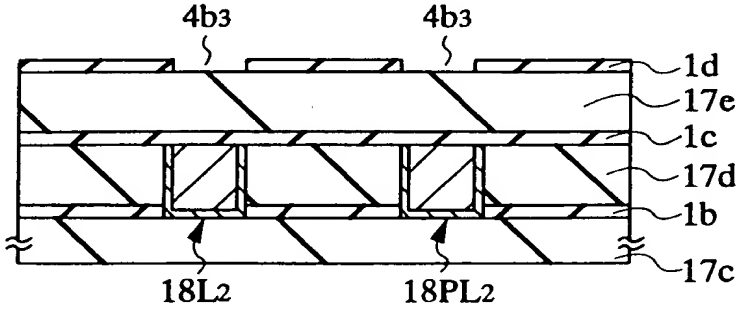


FIG. 30 (b)



~~FIG. 31~~

FIG. 31 (a)

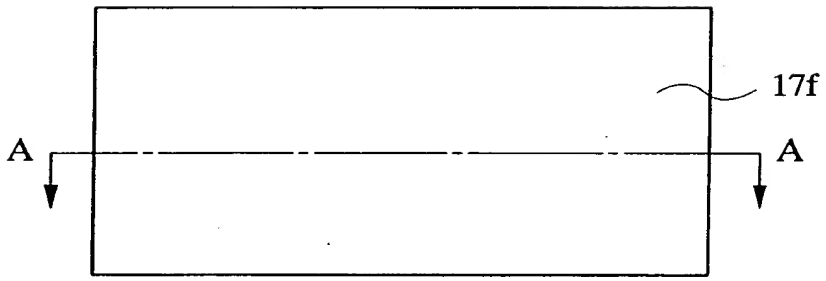
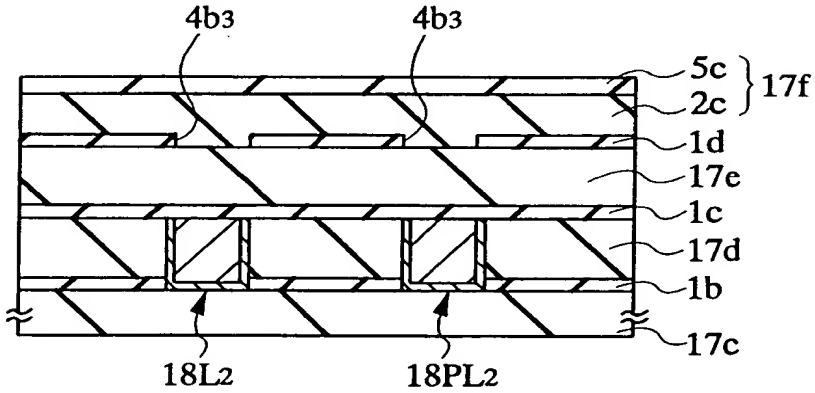


FIG. 31 (b)



~~FIG. 32~~

FIG. 32(a)

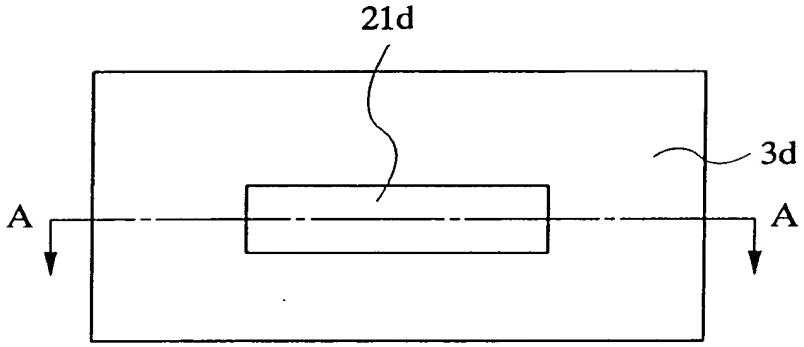
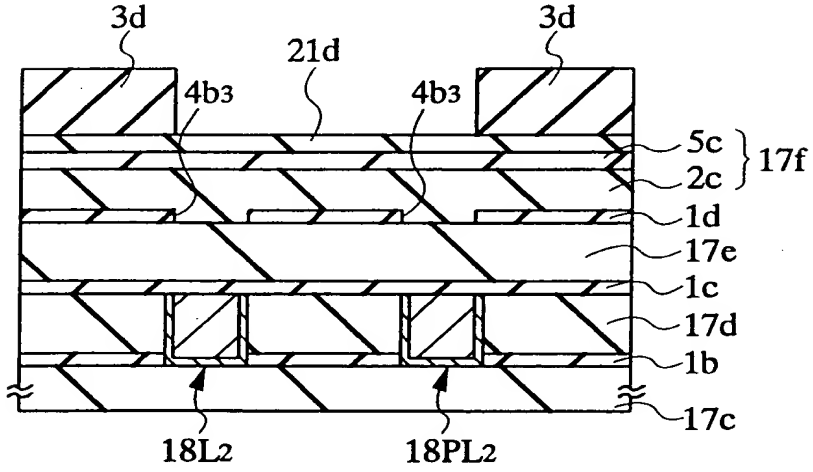


FIG. 32(b)



~~FIG. 33~~

FIG. 33 (a)

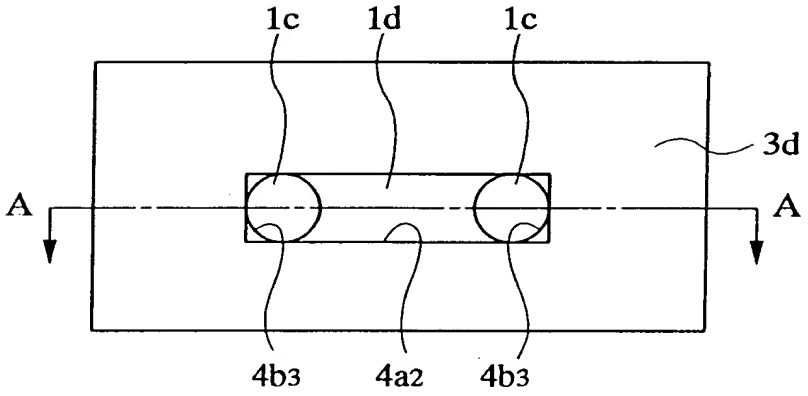
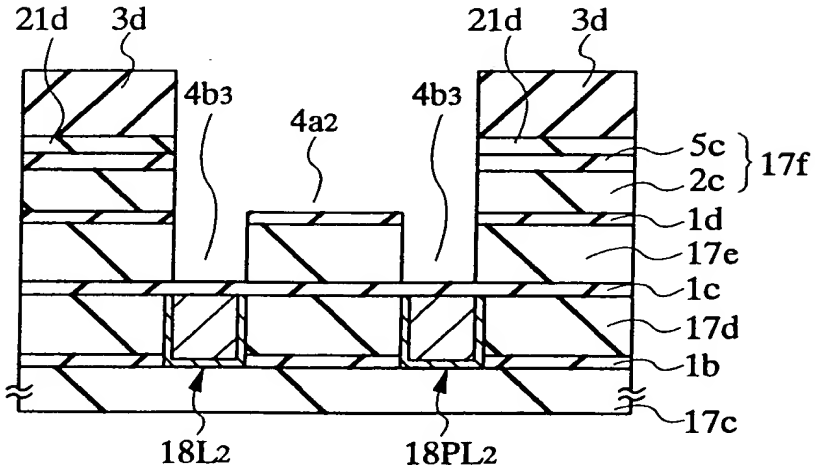


FIG. 33 (b)



~~FIG. 34~~

FIG. 34 (a)

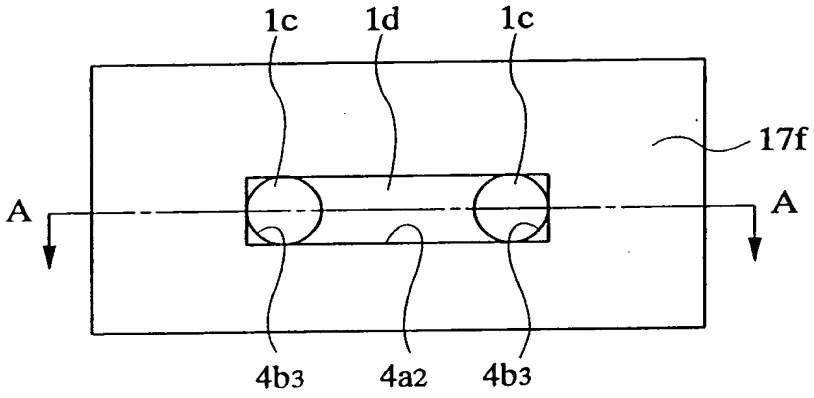
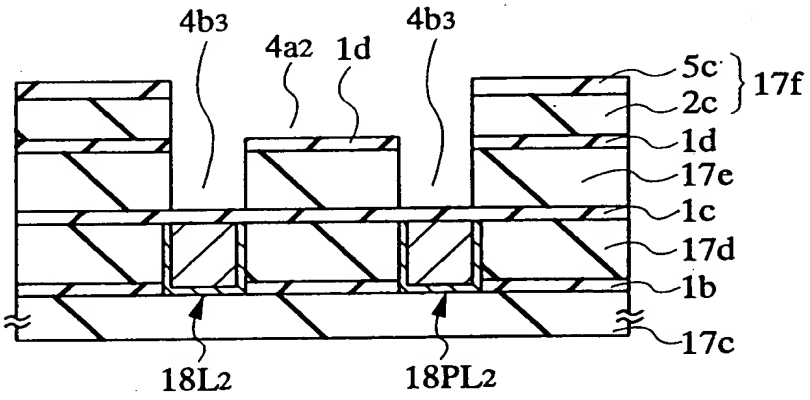


FIG. 34 (b)



~~FIG. 35~~

FIG.35 (a)

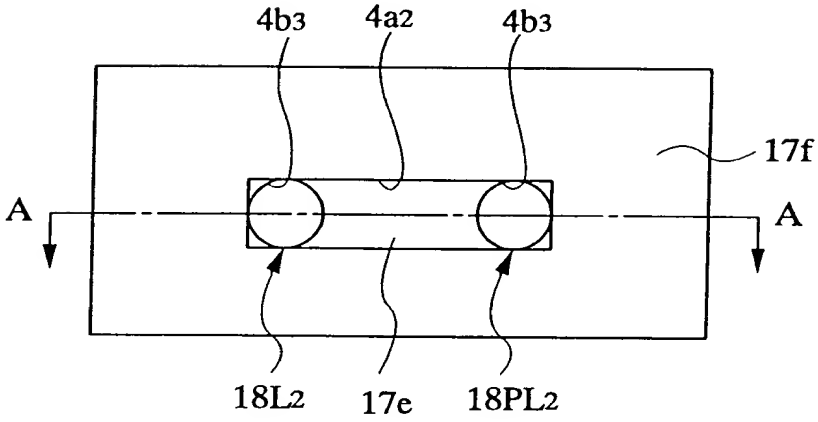
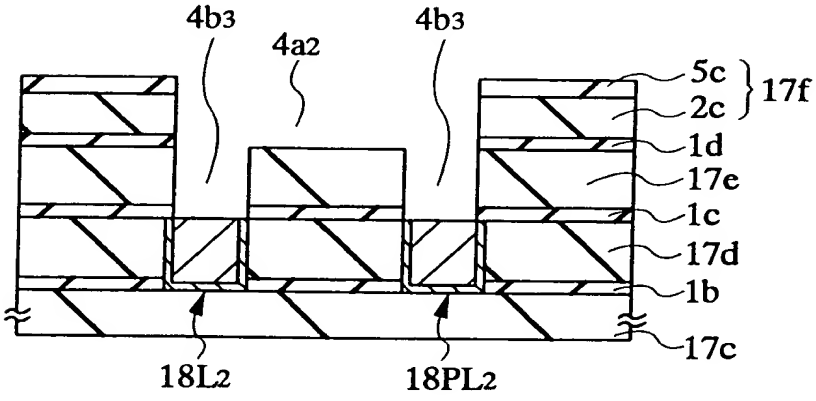


FIG.35 (b)



~~FIG. 36~~

FIG. 36 (a)

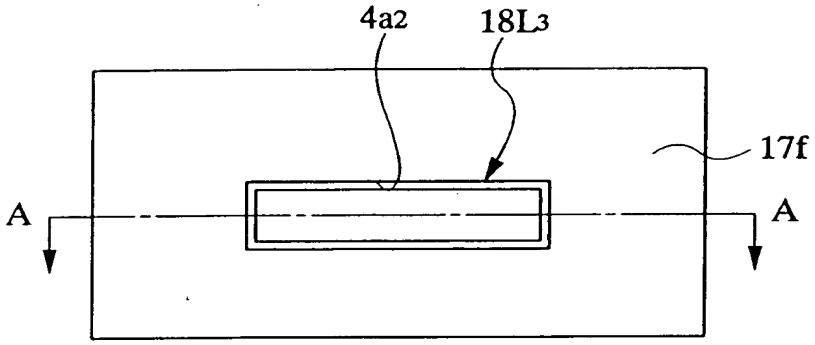
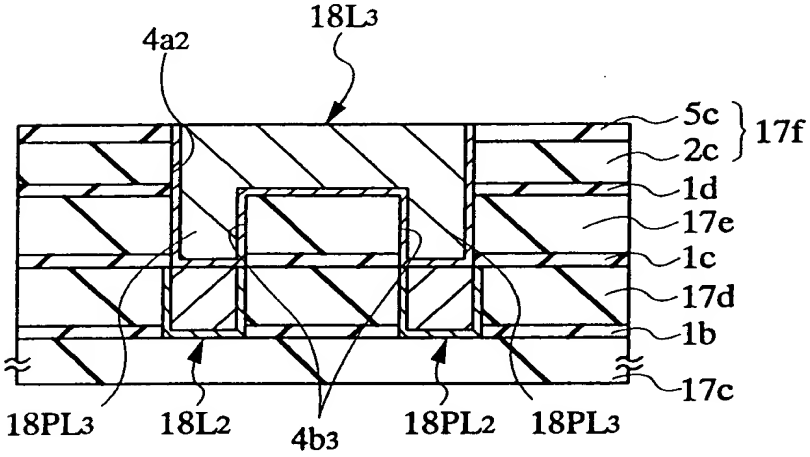


FIG. 36 (b)



~~FIG. 37~~

FIG. 37 (a)

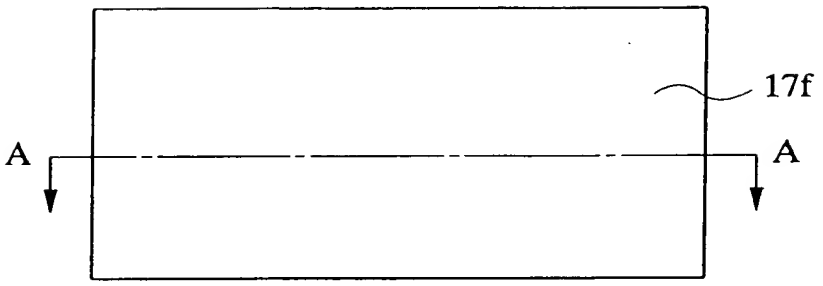
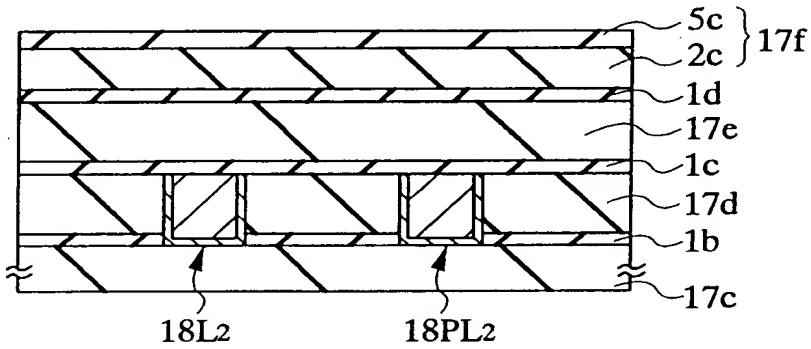


FIG. 37 (b)



~~FIG. 38~~

FIG. 38 (a)

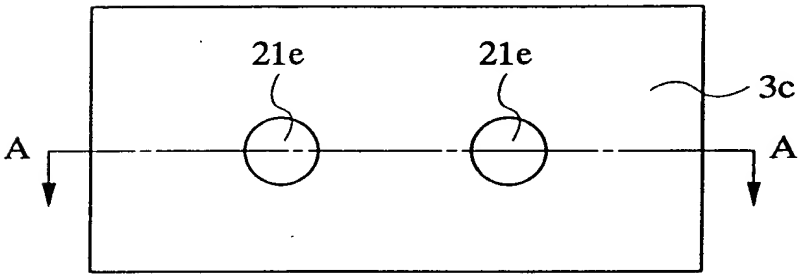
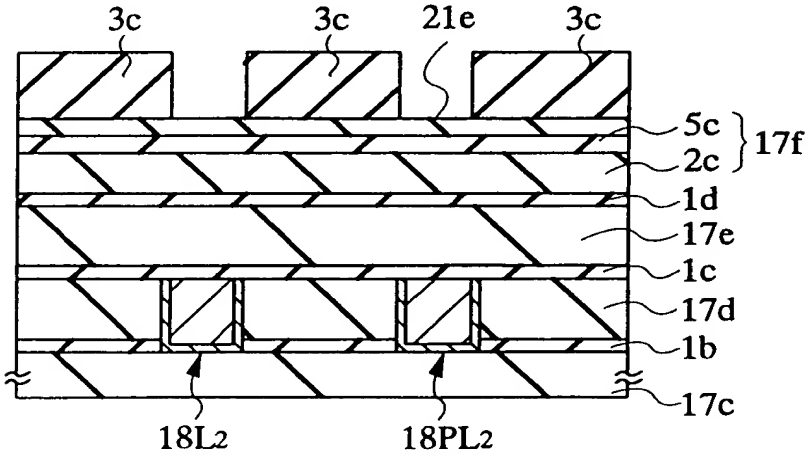


FIG. 38 (b)



~~FIG. 39~~

FIG. 39 (a)

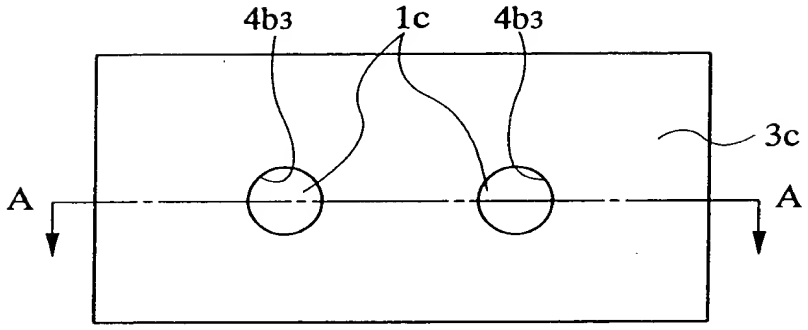
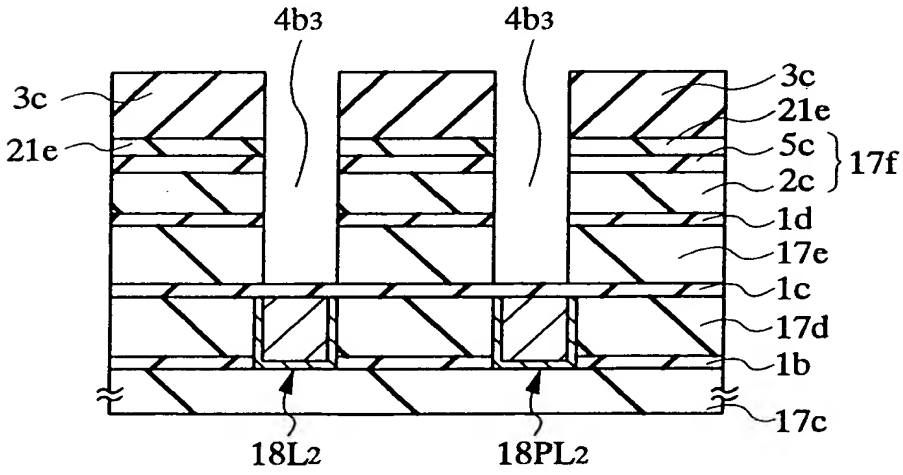


FIG. 39 (b)



~~FIG. 40~~

FIG. 40 (a)

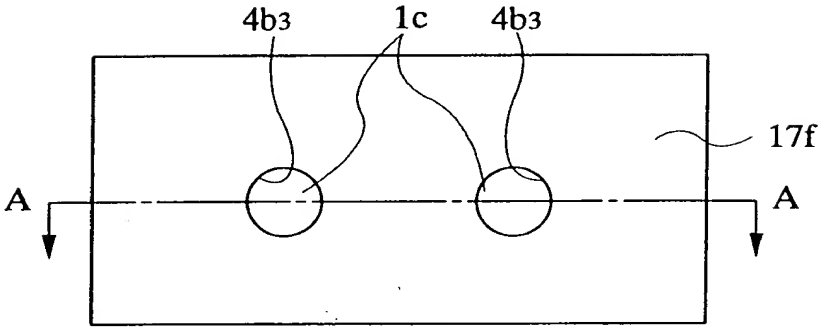
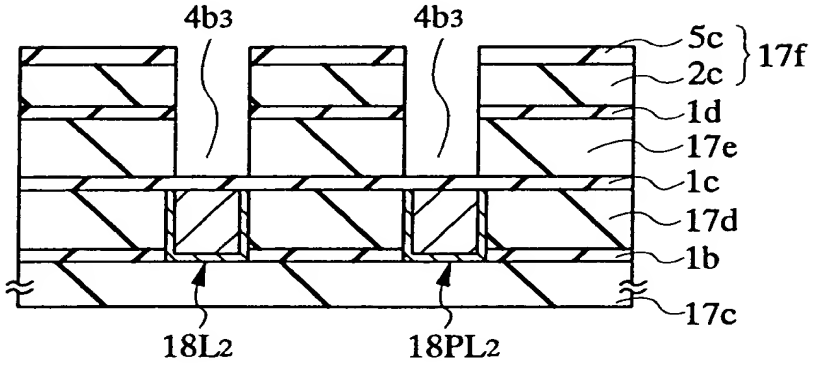


FIG. 40 (b)



~~FIG. 41~~

FIG. 41 (a)

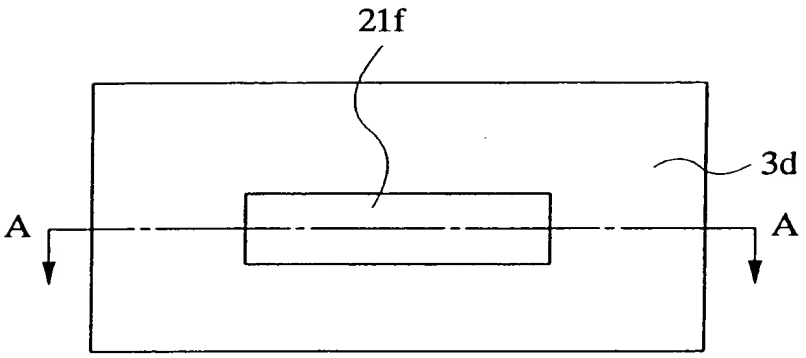
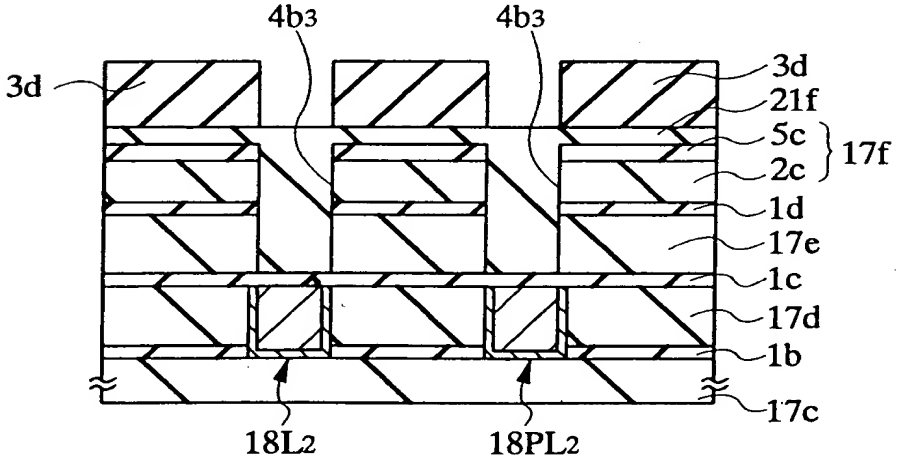


FIG. 41 (b)



~~FIG. 42~~

FIG. 42 (a)

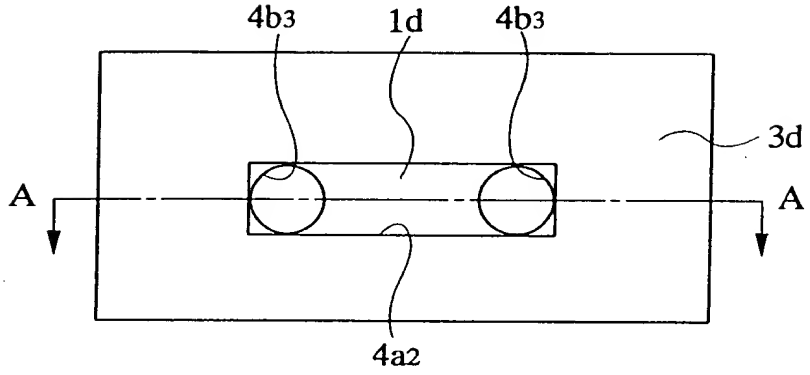
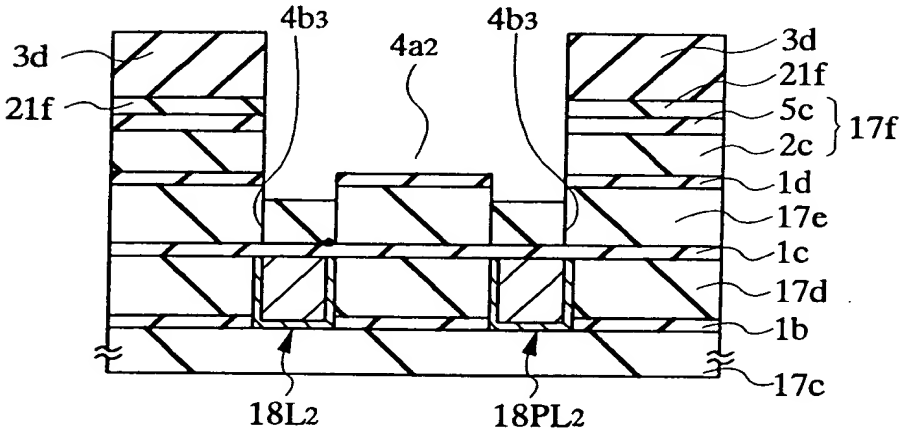


FIG. 42 (b)



~~FIG. 43~~

FIG. 43 (a)

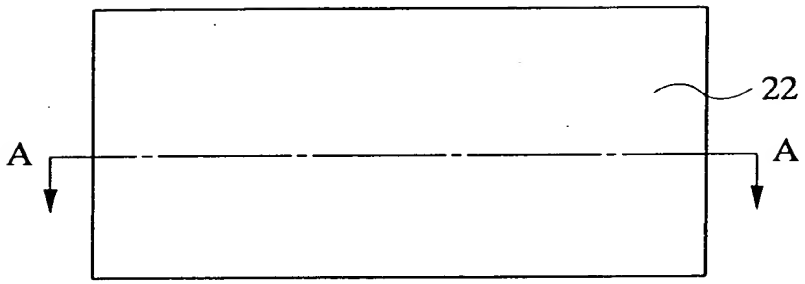


FIG. 43 (b)

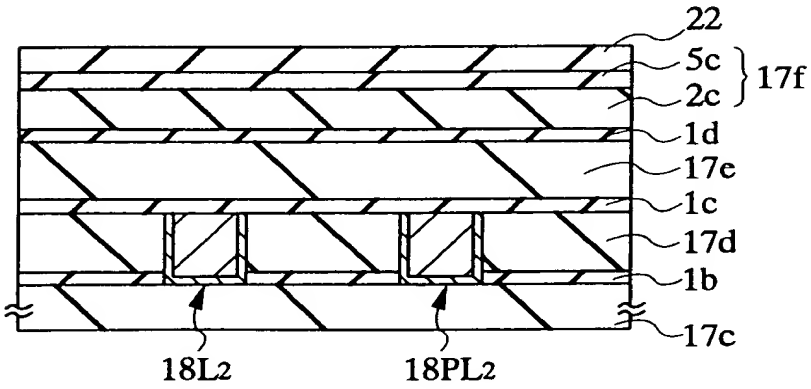


FIG. 44

FIG. 44 (a)

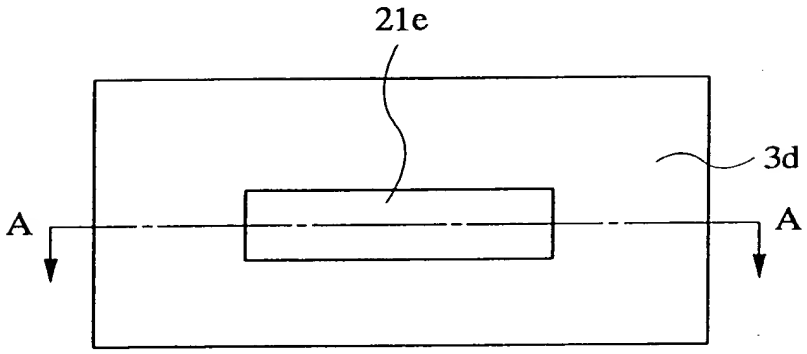
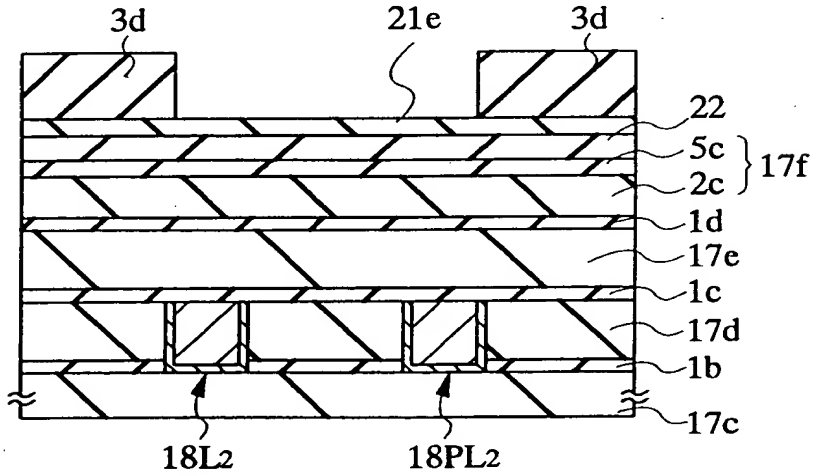


FIG. 44 (b)



~~FIG. 45~~

FIG. 45 (a)

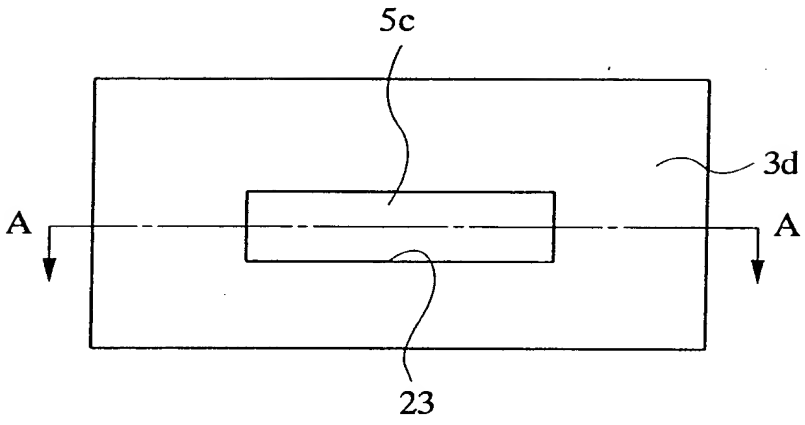
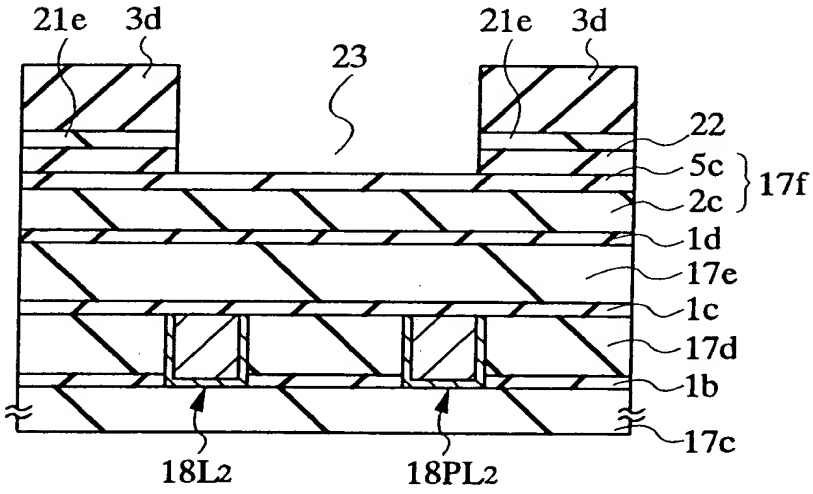


FIG. 45 (b)



~~FIG. 46~~

FIG. 46(a)

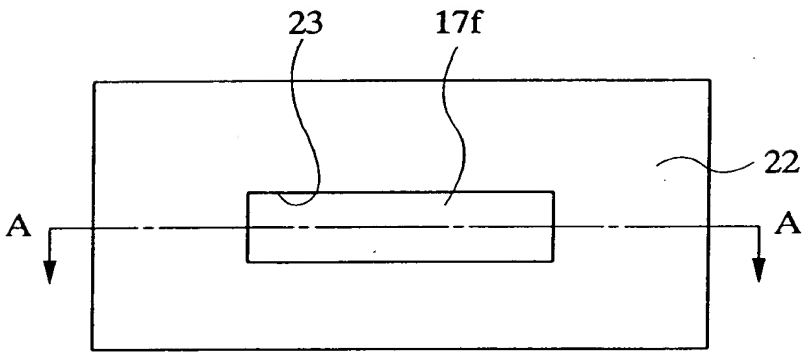
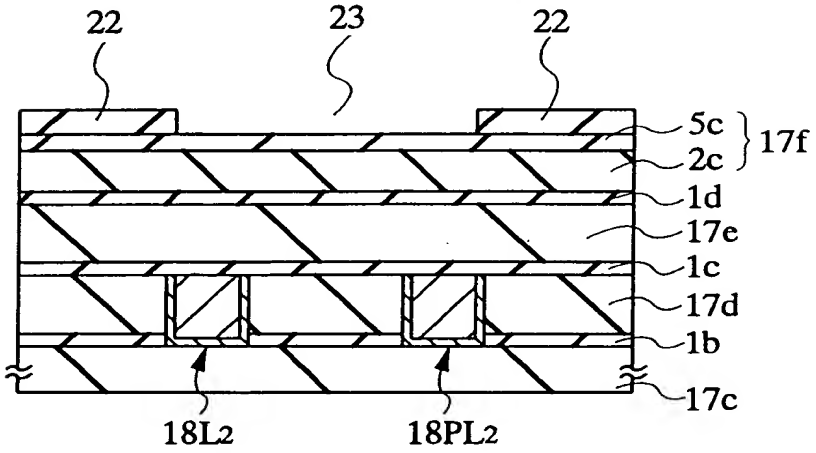


FIG. 46(b)



~~FIG. 47~~

FIG. 47 (a)

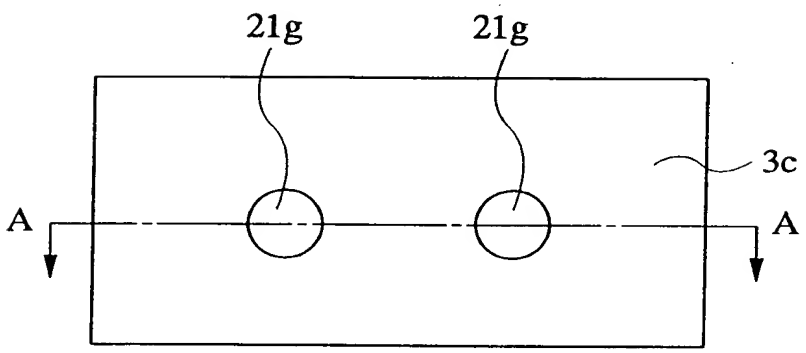
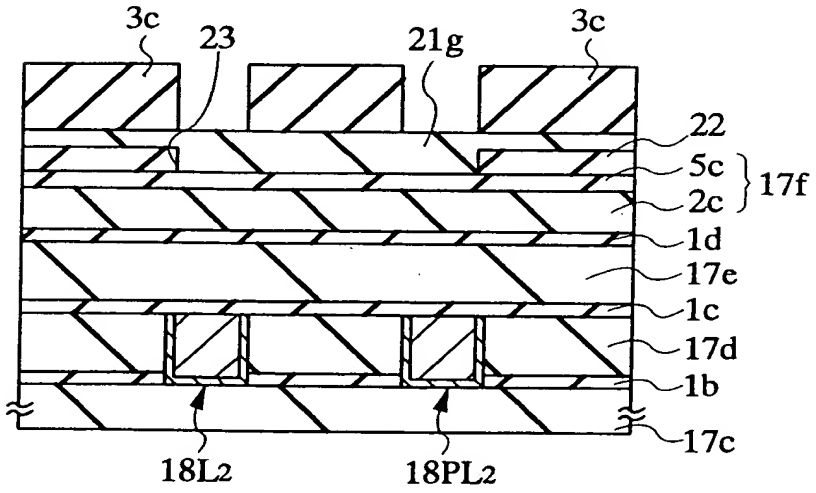


FIG. 47 (b)



~~FIG. 48.~~

FIG. 48(a)

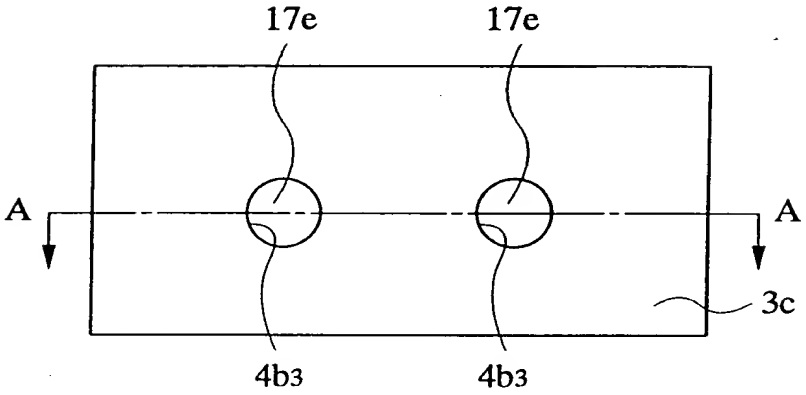
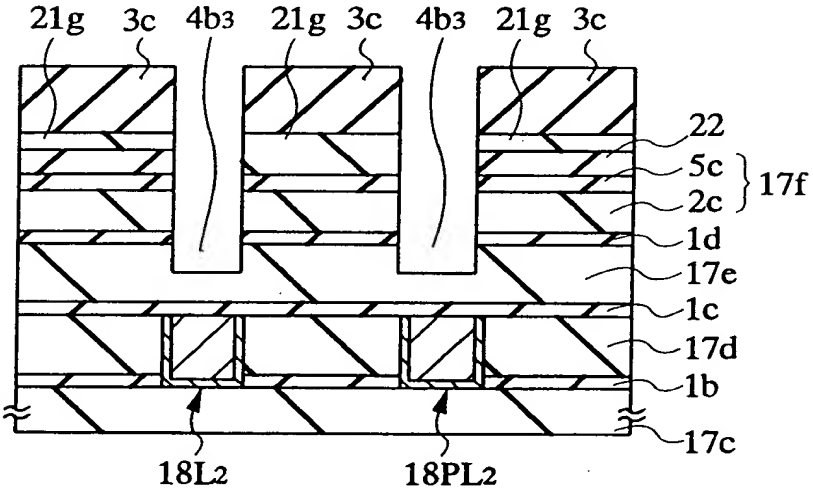


FIG. 48(b)



~~FIG. 49~~

FIG. 49 (a)

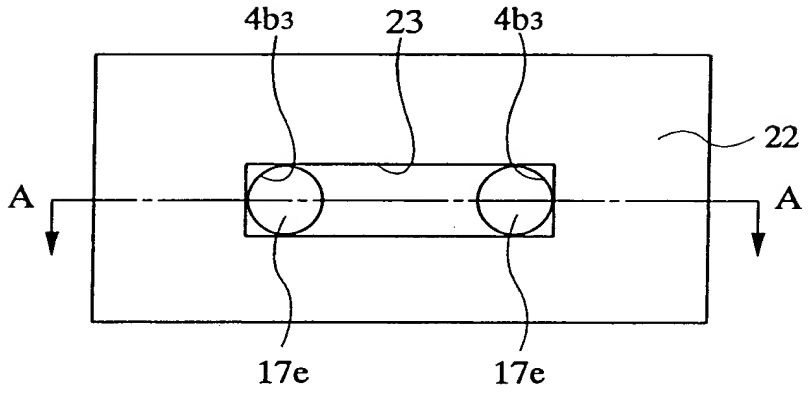
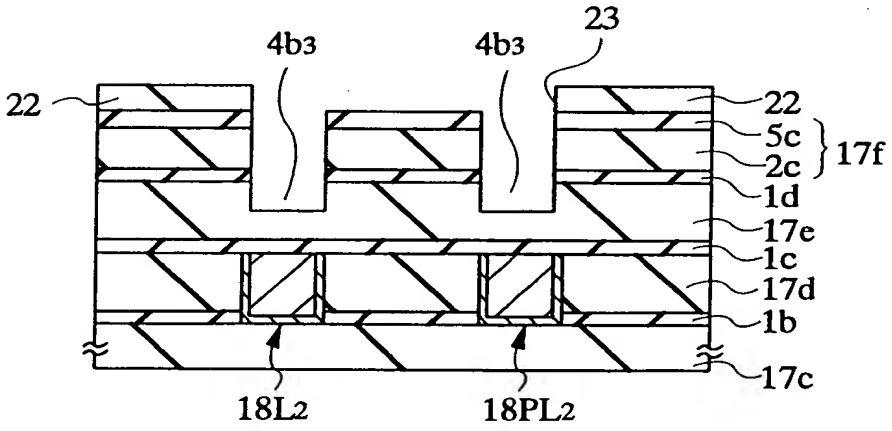


FIG. 49 (b)



~~FIG. 50~~

FIG. 50 (a)

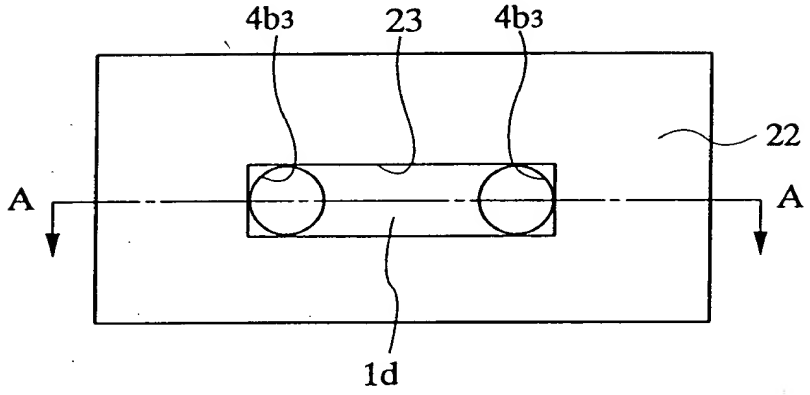
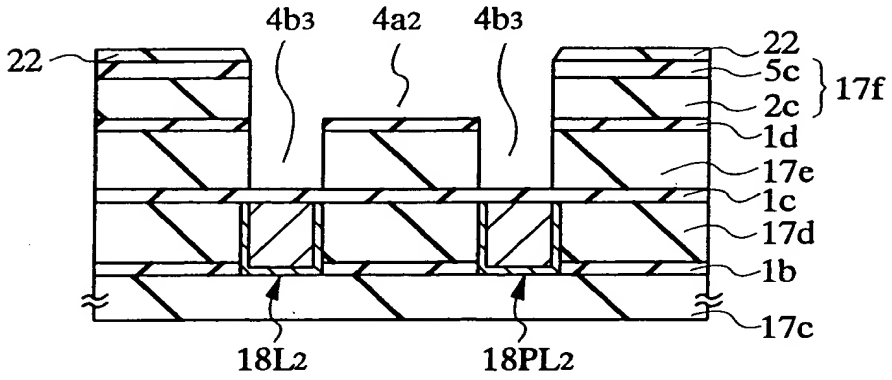


FIG. 50 (b)



~~FIG. 51~~

FIG. 51 (a)

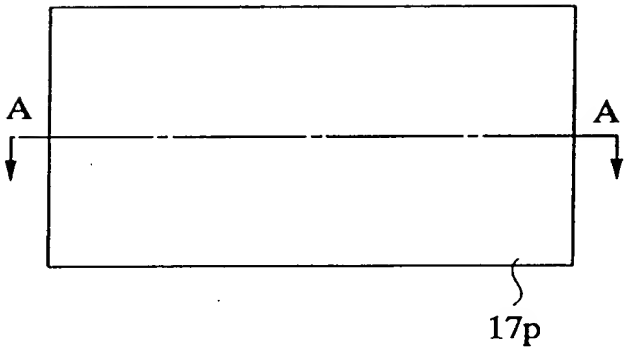
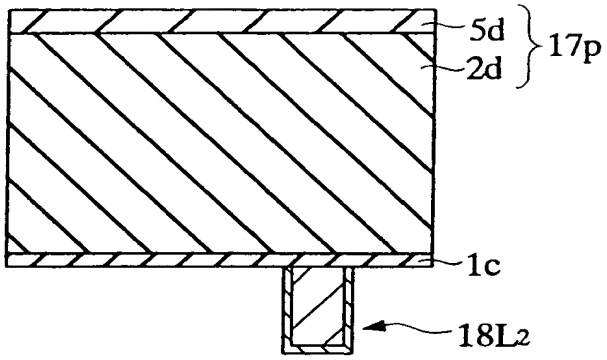


FIG. 51 (b)



~~FIG. 52~~

FIG. 52 (a)

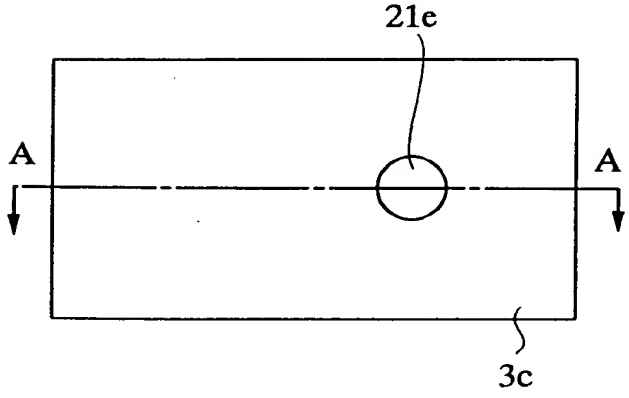
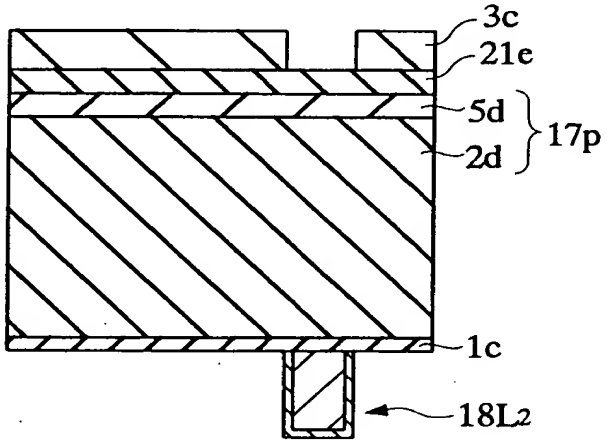


FIG. 52 (b)



~~FIG. 53~~

FIG. 53 (a)

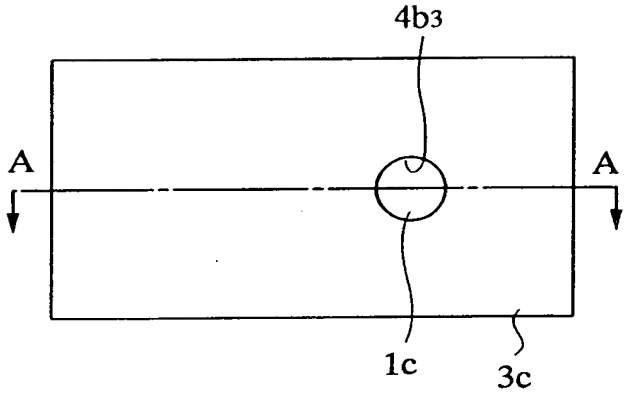
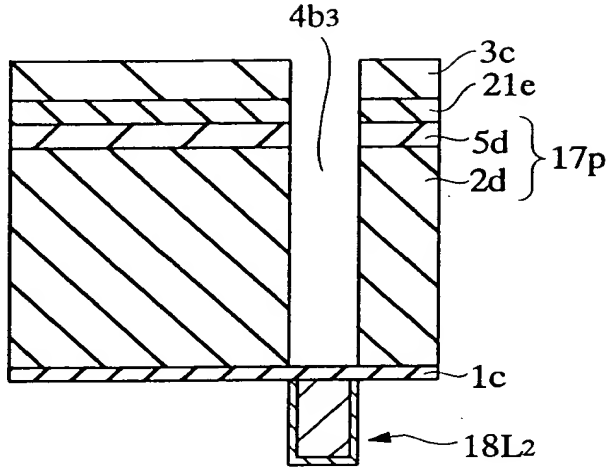


FIG. 53 (b)



~~FIG. 54~~

FIG. 54 (a)

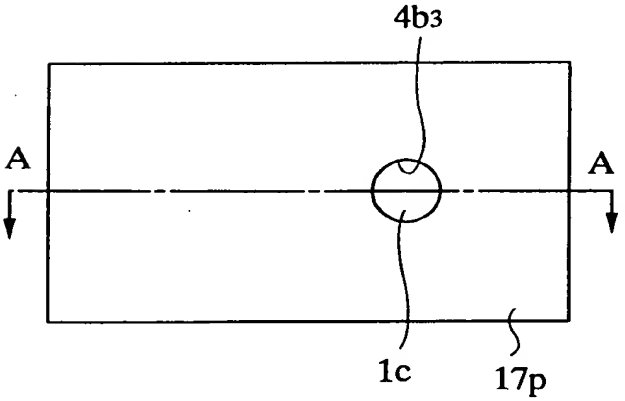
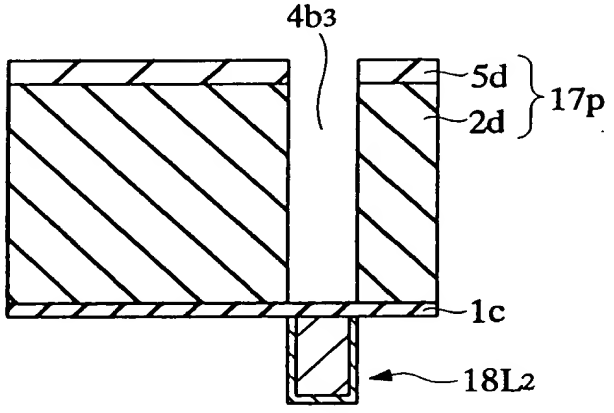


FIG. 54 (b)



~~FIG. 55~~

FIG. 55 (a)

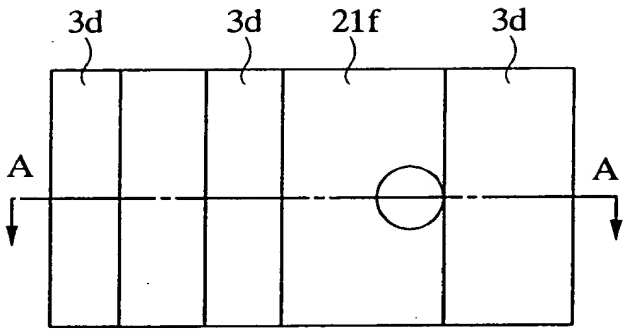
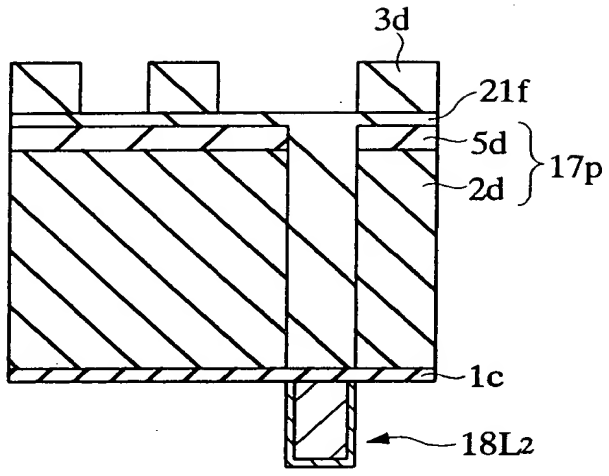


FIG. 55 (b)



~~FIG. 56~~

FIG. 56 (a)

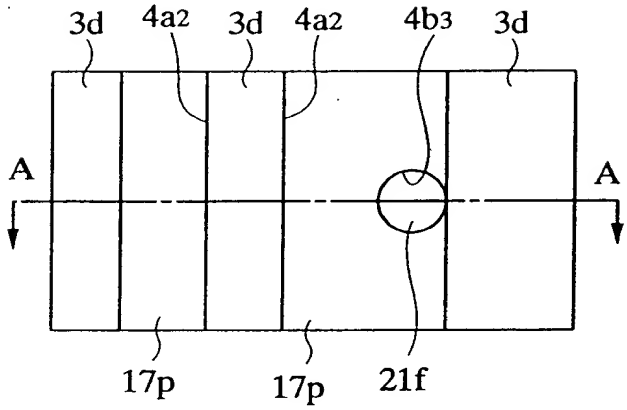
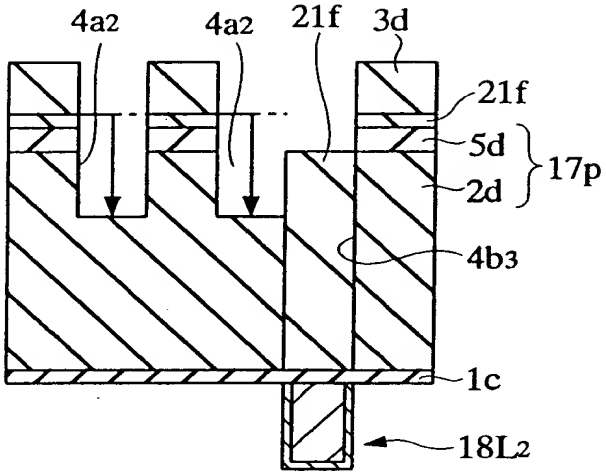


FIG. 56 (b)



~~FIG. 57~~

FIG. 57 (a)

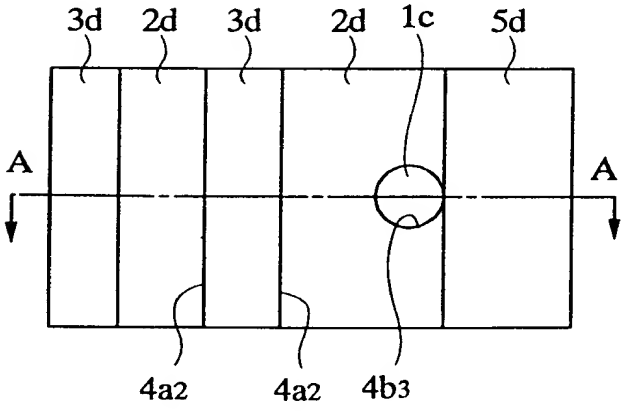
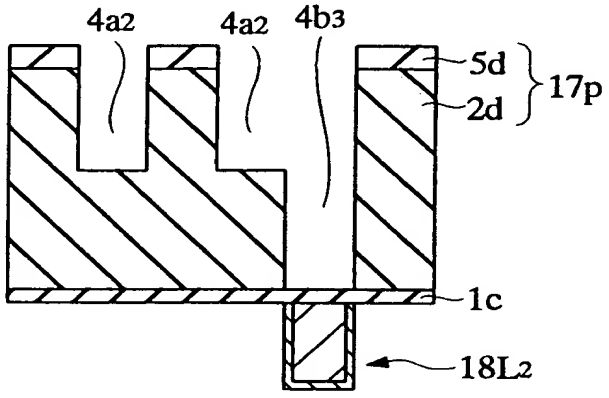


FIG. 57 (b)



~~FIG. 58~~

FIG. 58 (a)

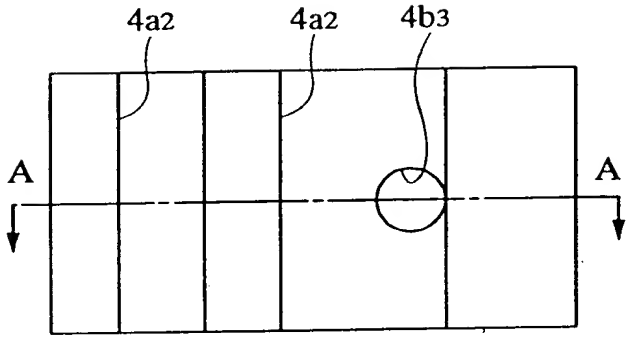
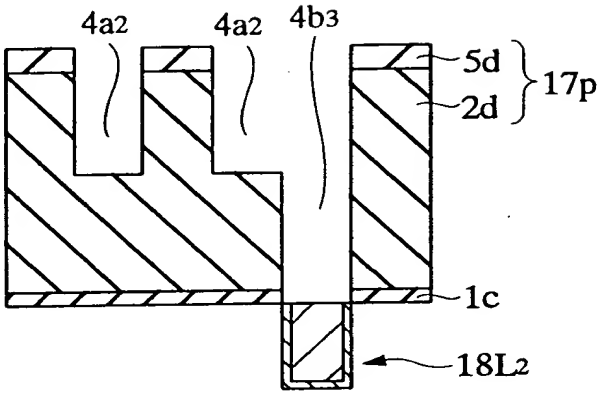


FIG. 58 (b)



~~FIG. 59~~

FIG. 59 (a)

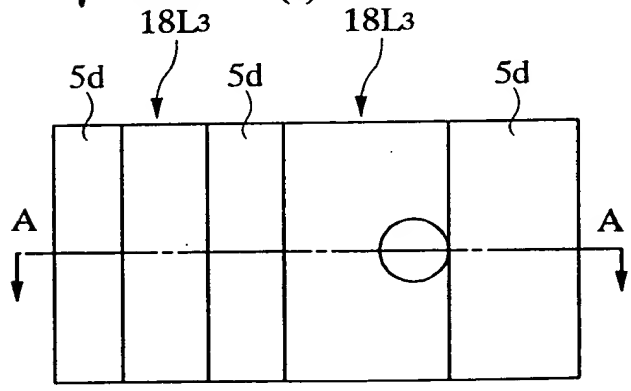
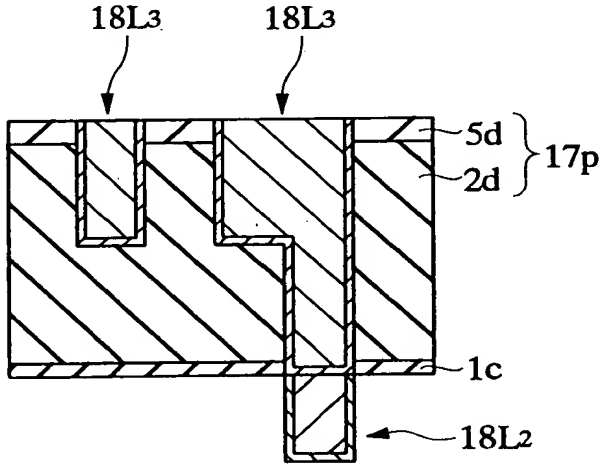


FIG. 59 (b)



~~FIG. 61~~

FIG. 61 (a)

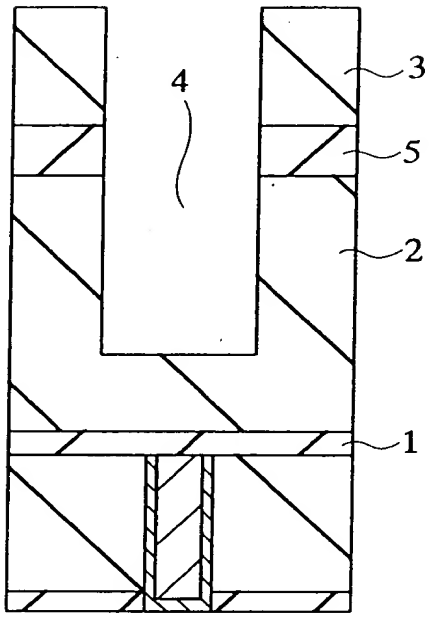
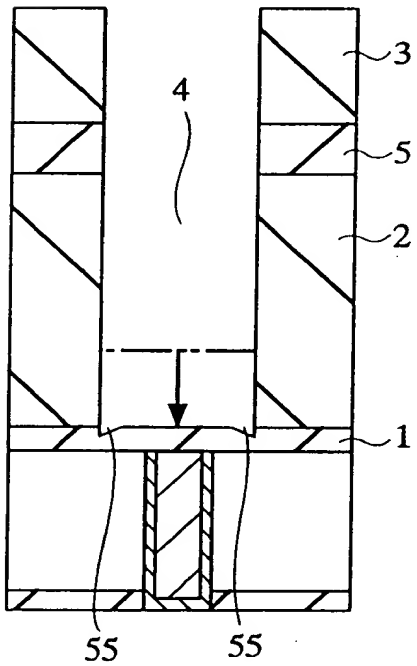


FIG. 61 (b)



~~FIG. 62~~

FIG 62 (a)

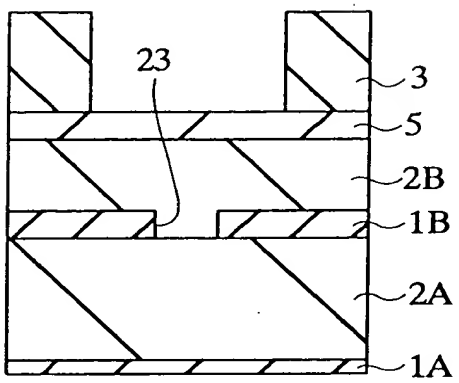


FIG. 62 (b)

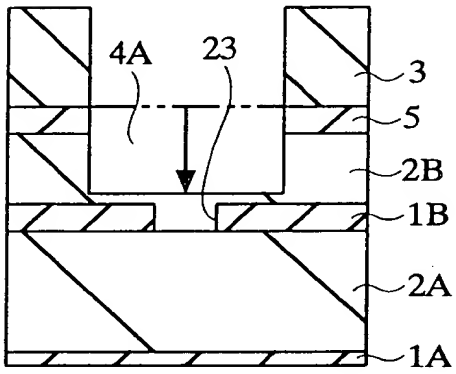
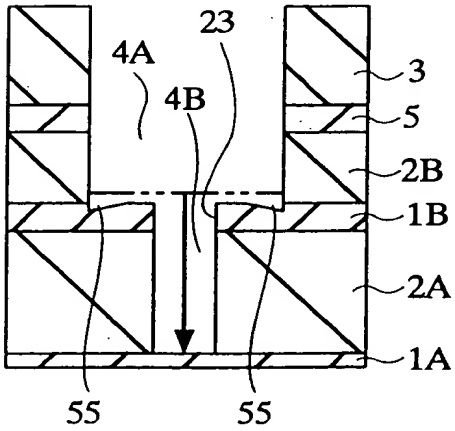


FIG. 62 (c)



~~FIG. 63~~

FIG. 63 (a)

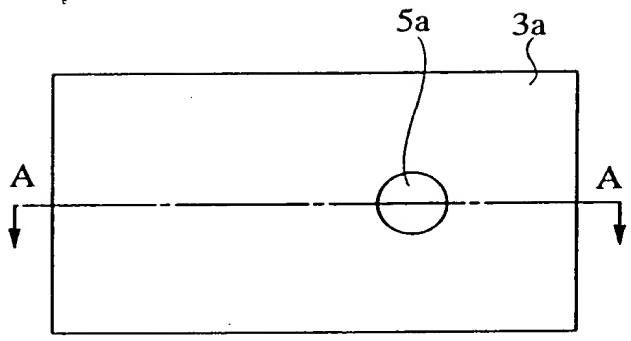
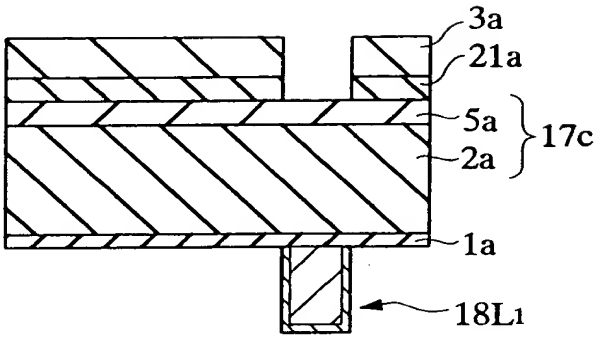


FIG. 63 (b)



~~FIG. 64~~

FIG. 64 (a)

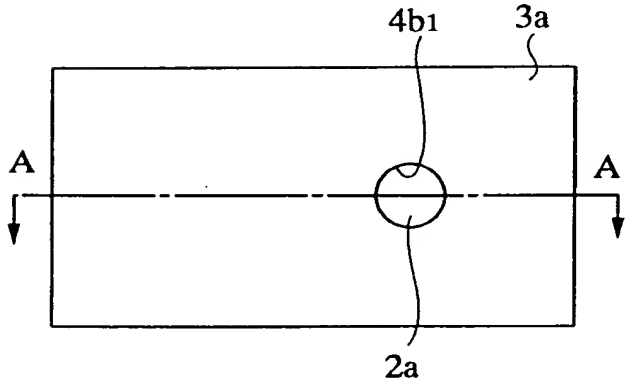
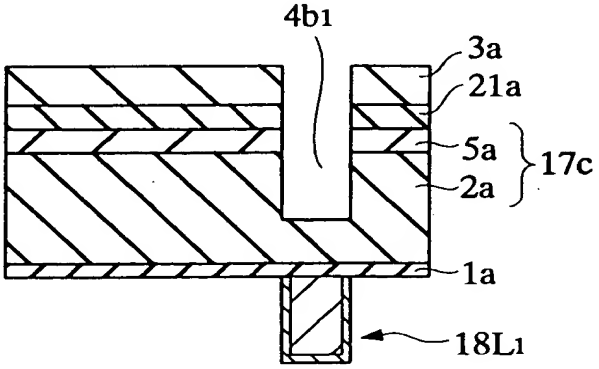


FIG. 64 (b)



~~FIG. 65~~

FIG. 65 (a)

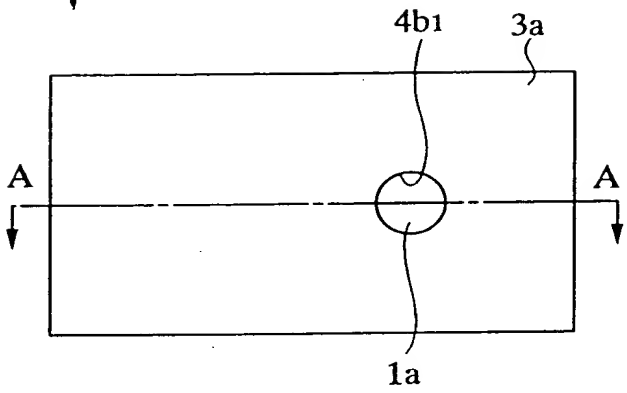
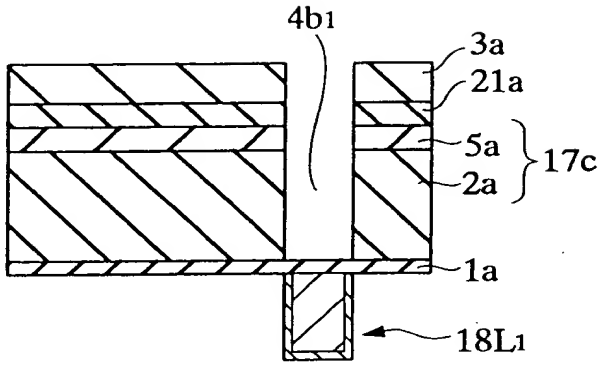


FIG. 65 (b)



~~FIG. 66~~

FIG. 66 (a)

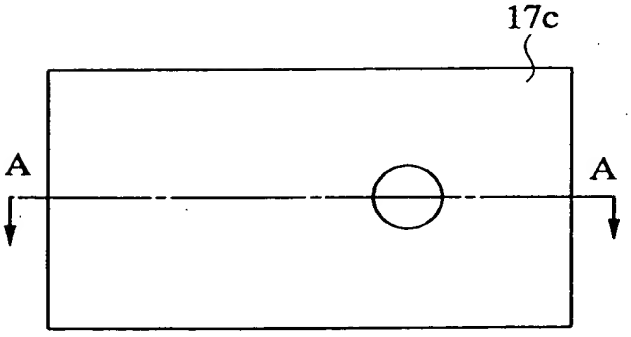
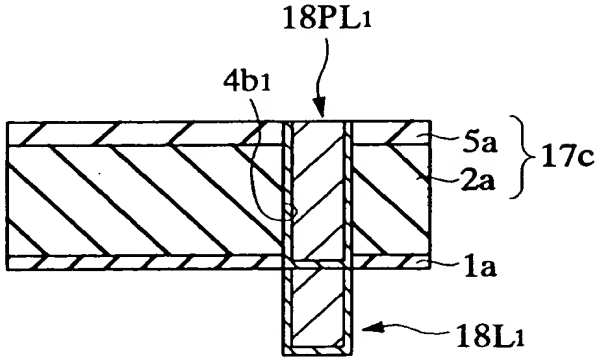


FIG. 66 (b)



~~FIG. 67~~

FIG. 67 (a)

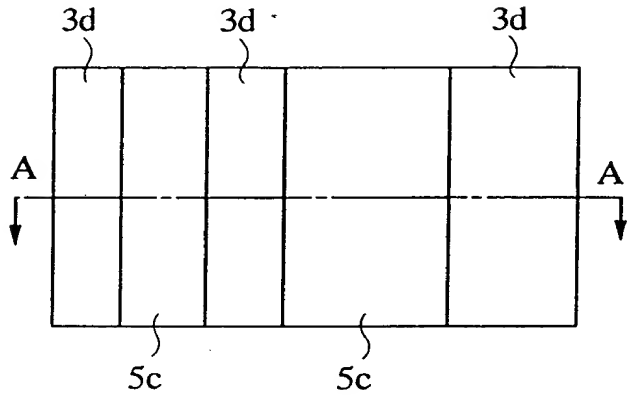
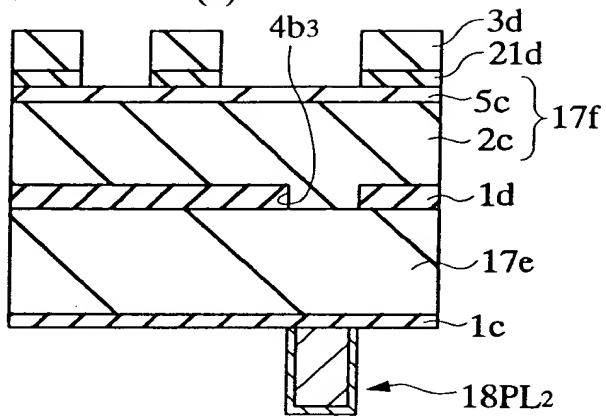


FIG. 67 (b)



~~FIG. 68~~

FIG. 68 (a)

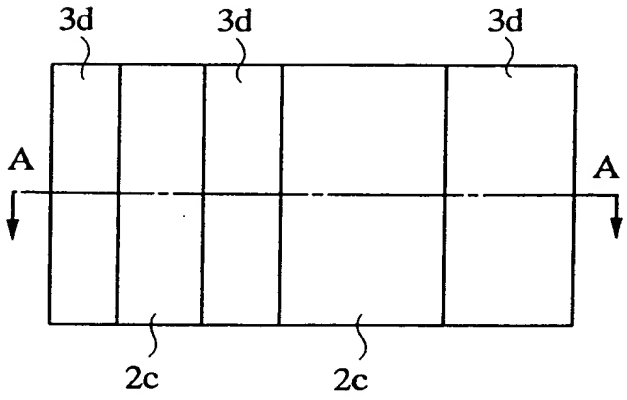
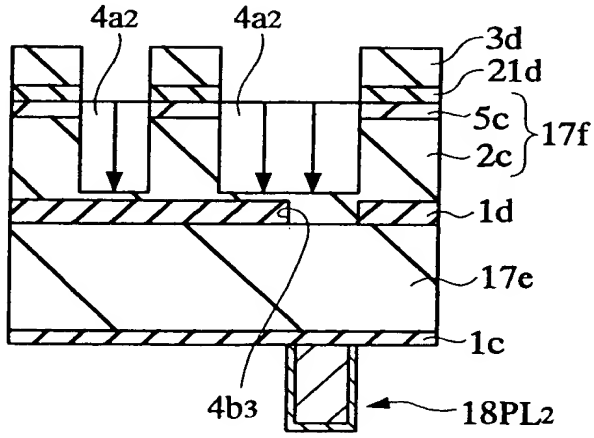


FIG. 68 (b)



~~FIG. 69~~

FIG. 69 (a)

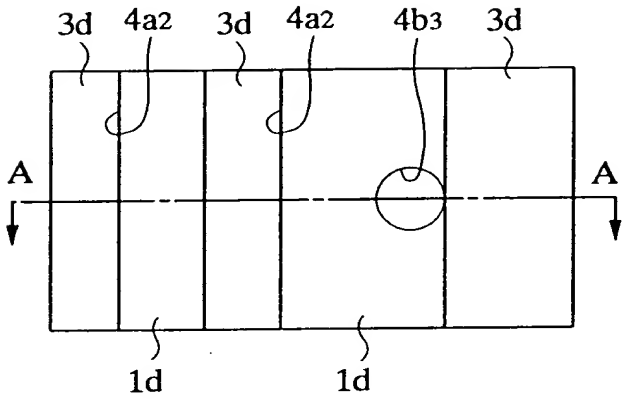
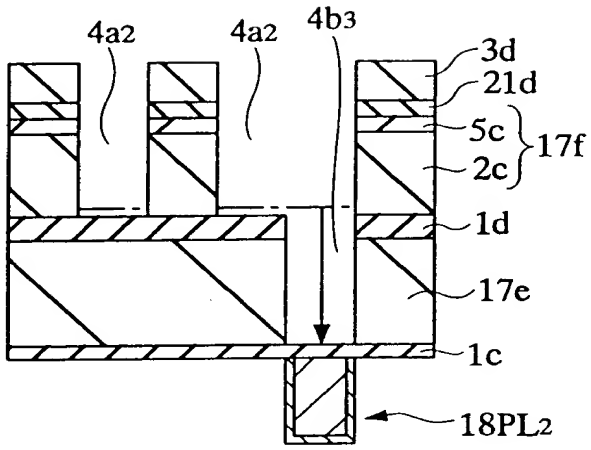


FIG. 69 (b)



~~FIG. 70~~

FIG. 70 (a)

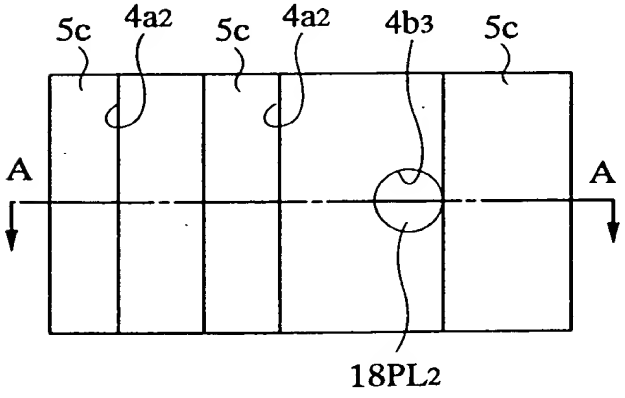
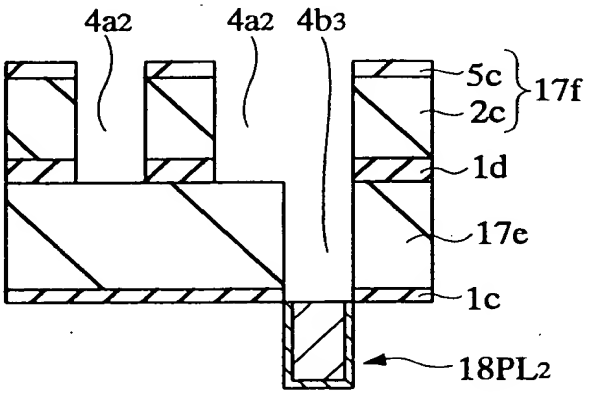


FIG. 70 (b)



~~FIG. 71~~

FIG. 71 (a)

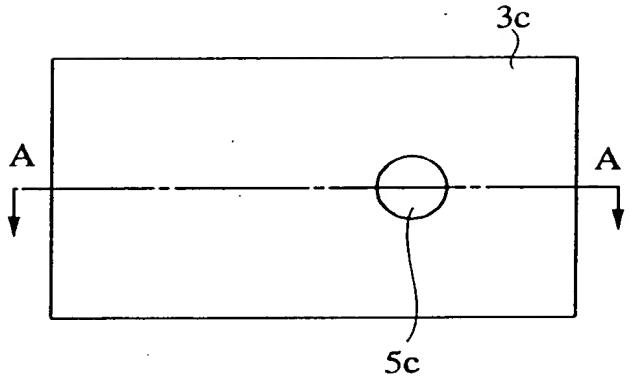
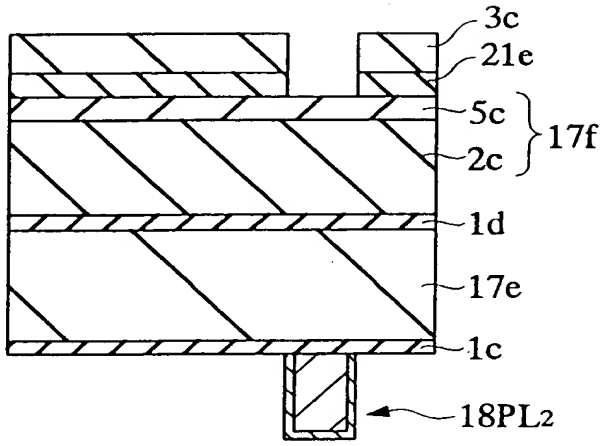


FIG. 71 (b)



~~FIG. 72~~

FIG. 72 (a)

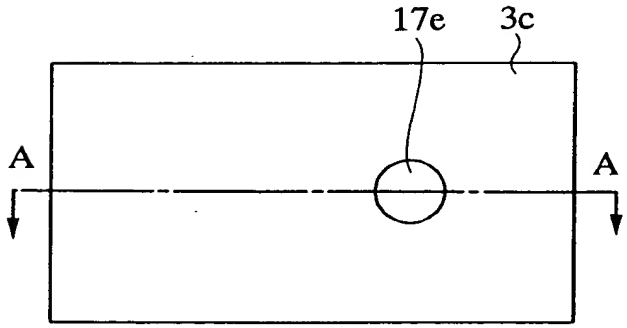
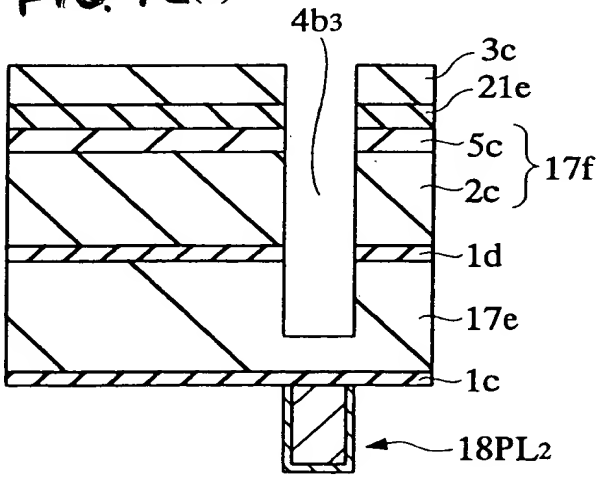


FIG. 72 (b)



~~FIG. 73~~

FIG. 73 (a)

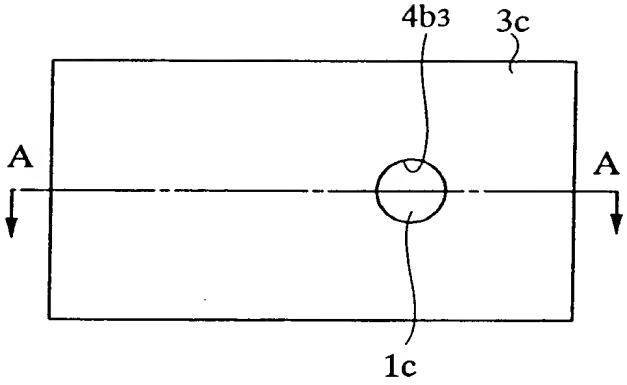
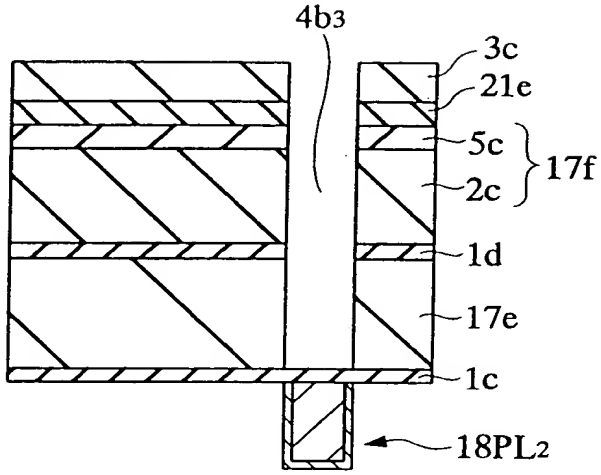


FIG 73 (b)



~~FIG. 74~~

FIG. 74 (a)

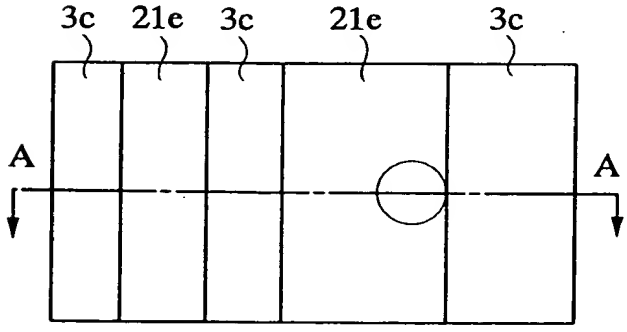
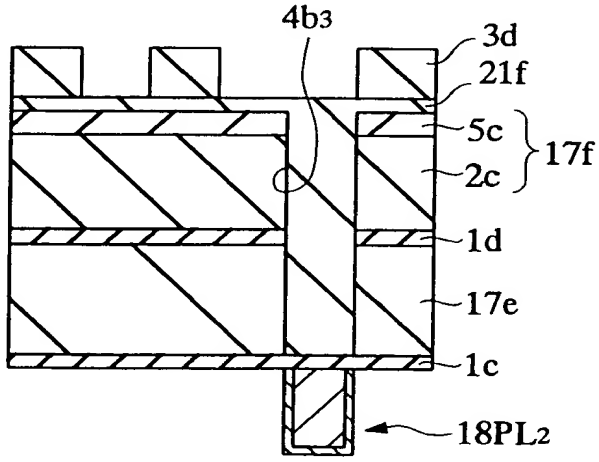


FIG. 74 (b)



~~FIG. 75~~

FIG. 75 (a)

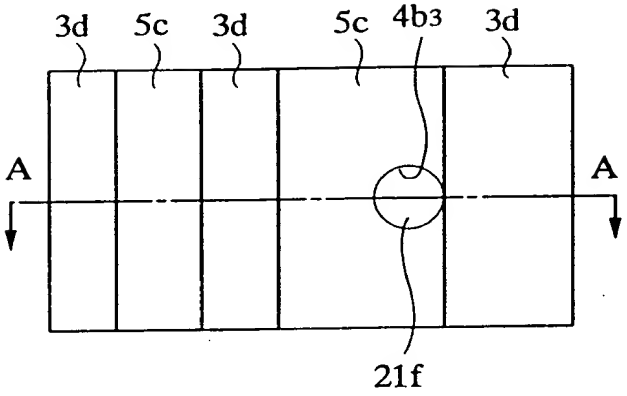
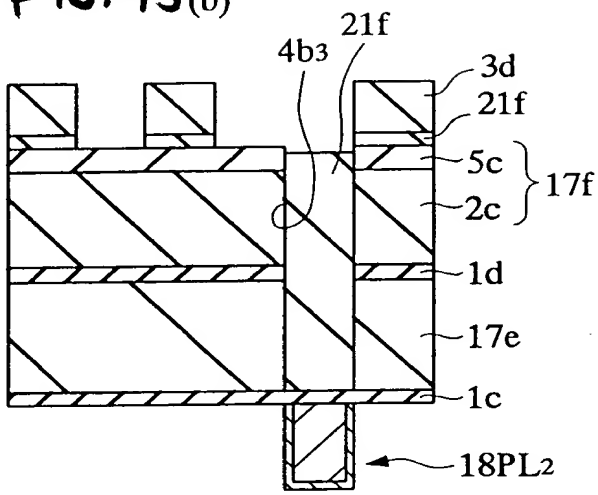


FIG. 75 (b)



~~FIG. 76~~

FIG. 76 (a)

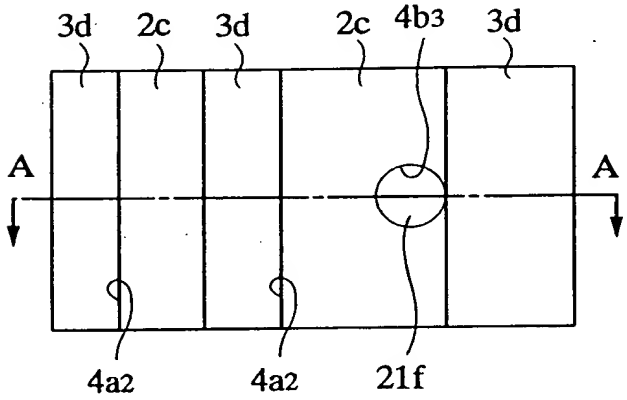
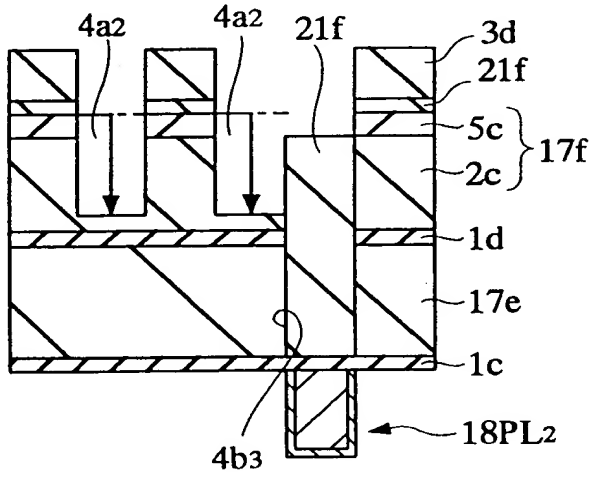


FIG. 76 (b)



~~FIG. 77~~

FIG. 77 (a)

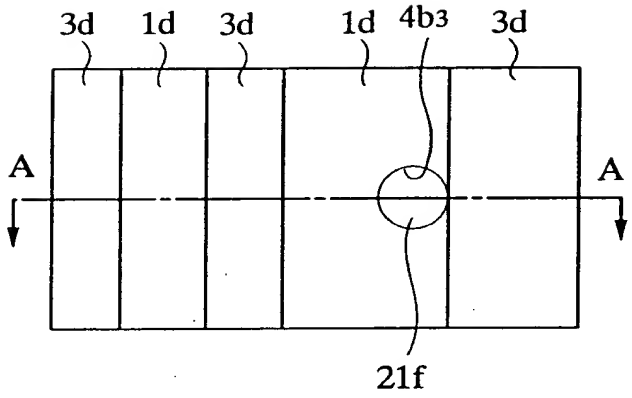
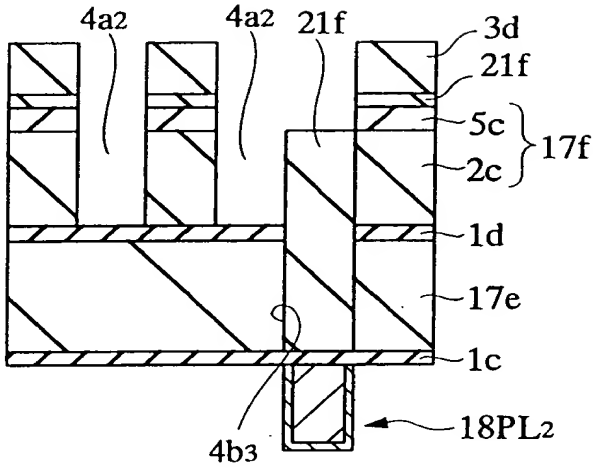


FIG. 77 (b)



~~FIG. 78~~

FIG. 78 (a)

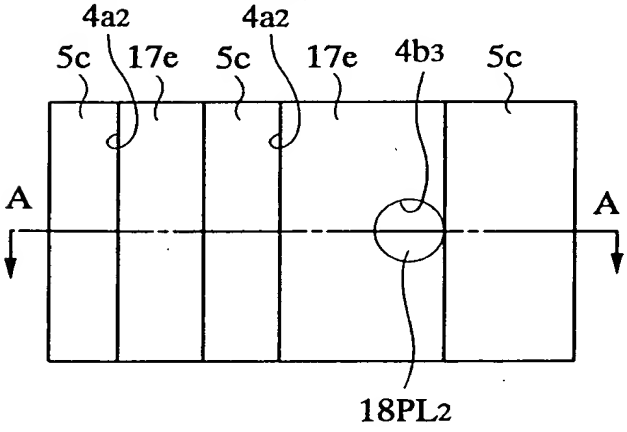
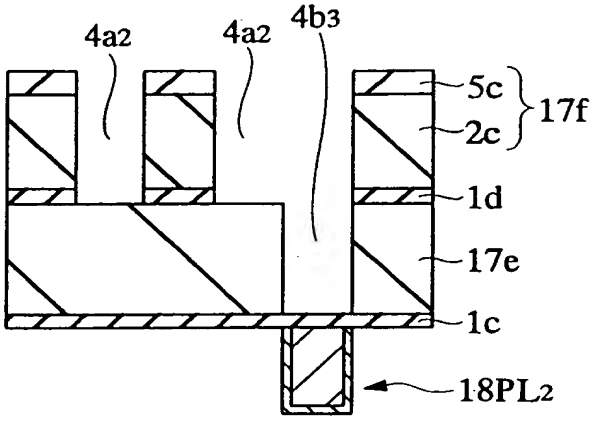


FIG. 78 (b)



~~FIG. 79~~

FIG. 79 (a)

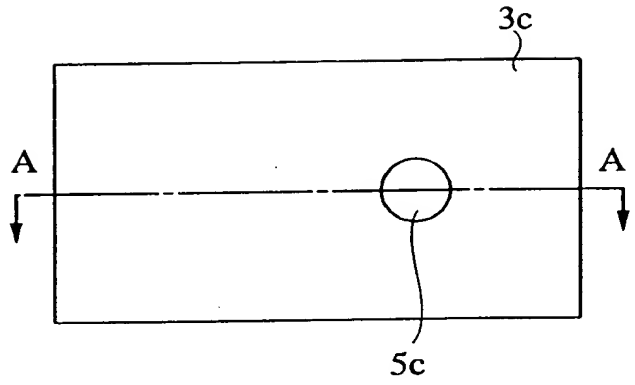
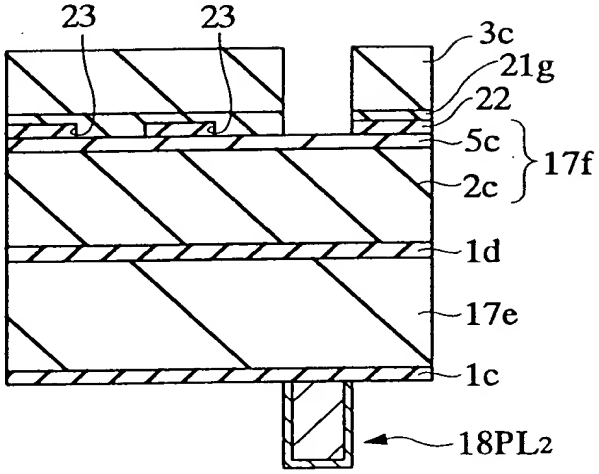


FIG. 79 (b)



~~FIG. 80~~

FIG. 80 (a)

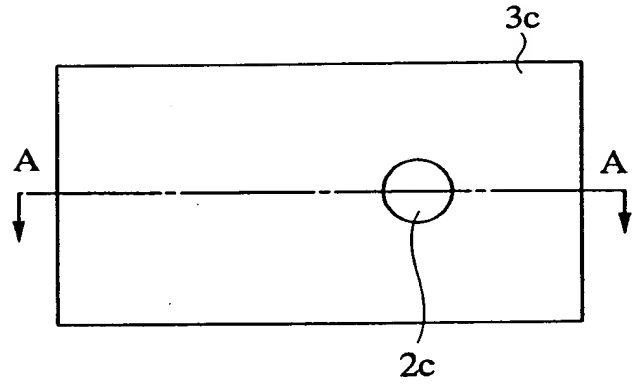
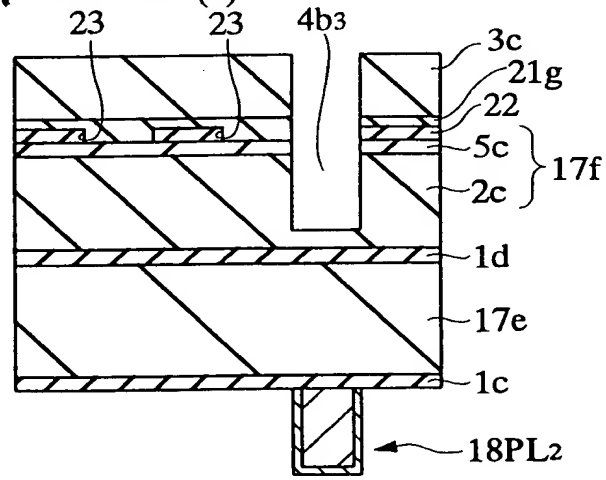


FIG. 80 (b)



~~FIG. 81~~

FIG. 81 (a)

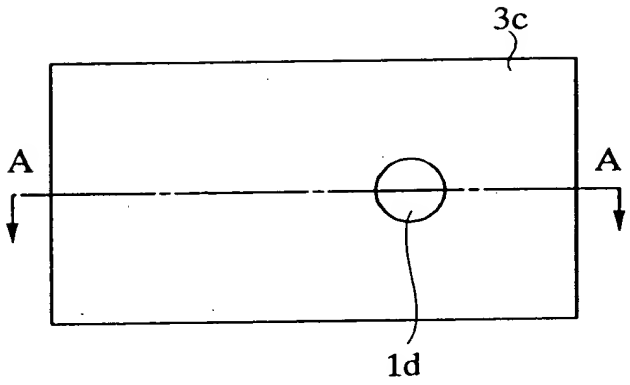
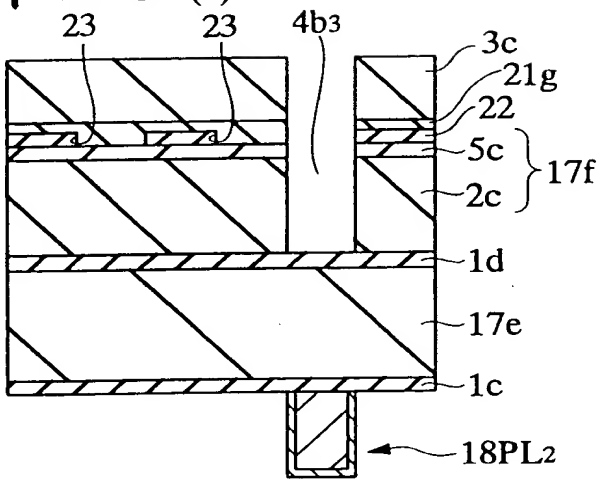


FIG. 81 (b)



~~FIG. 82~~

FIG. 82 (a)

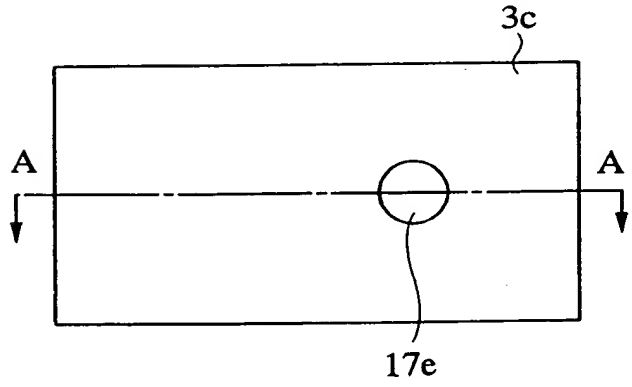
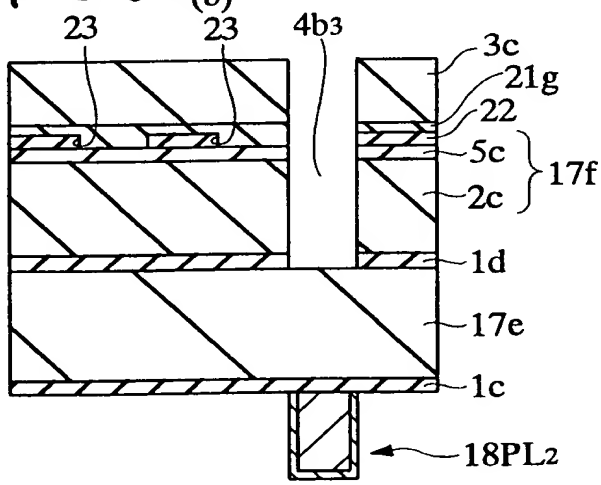


FIG. 82 (b)



~~FIG. 83~~

FIG. 83 (a)

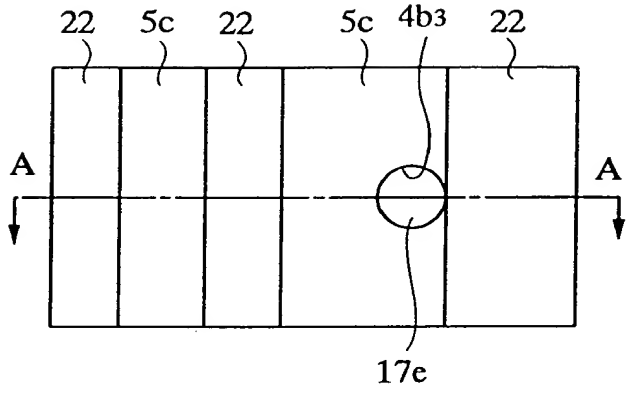
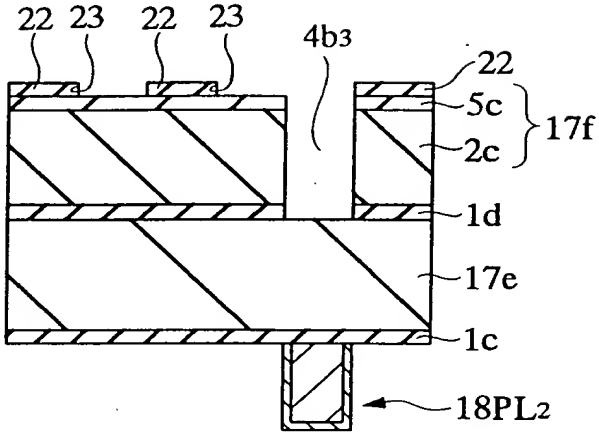


FIG. 83 (b)



~~FIG. 84~~

FIG. 84 (a)

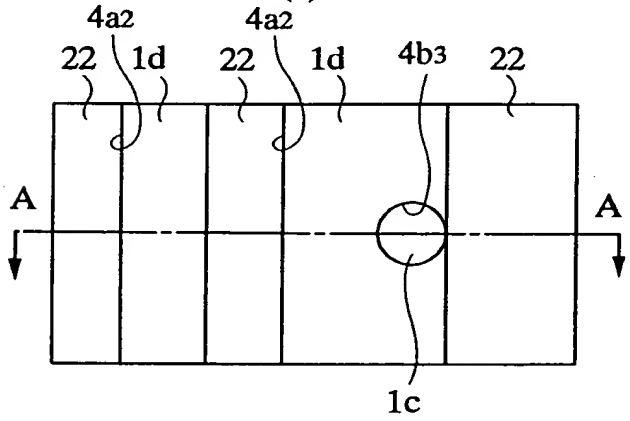
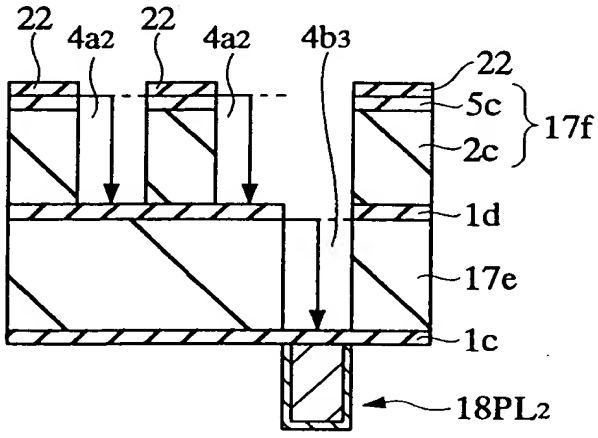


FIG. 84 (b)



~~FIG. 85~~

FIG. 85 (a)

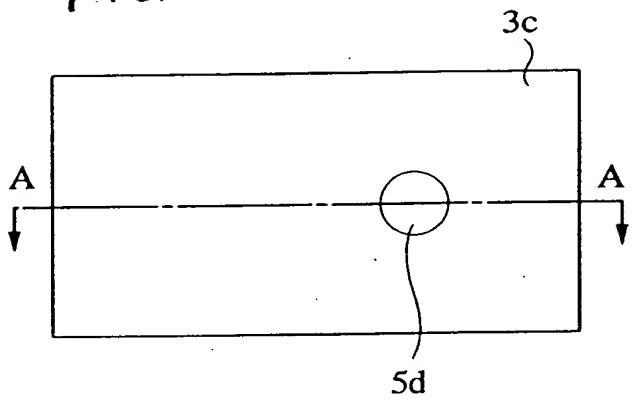
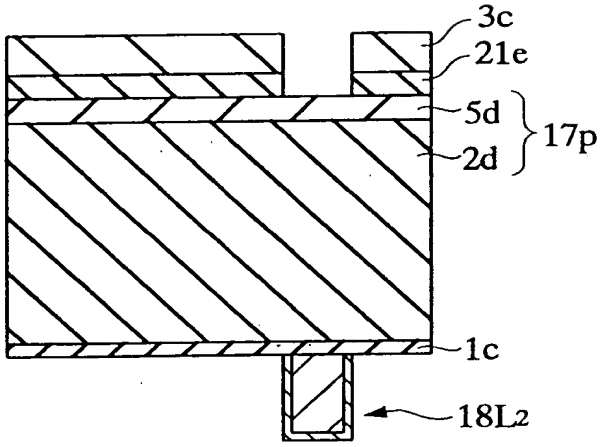


FIG 85 (b)



~~FIG. 86~~

FIG. 86 (a)

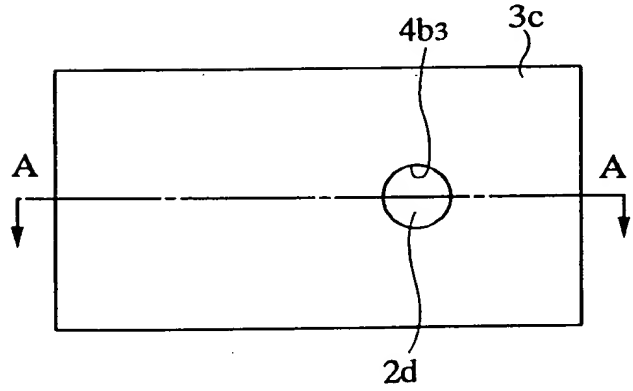
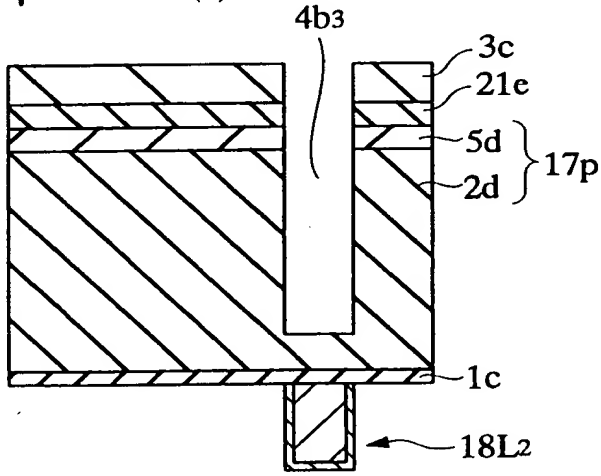


FIG. 86 (b)



~~FIG. 87~~

FIG. 87 (a)

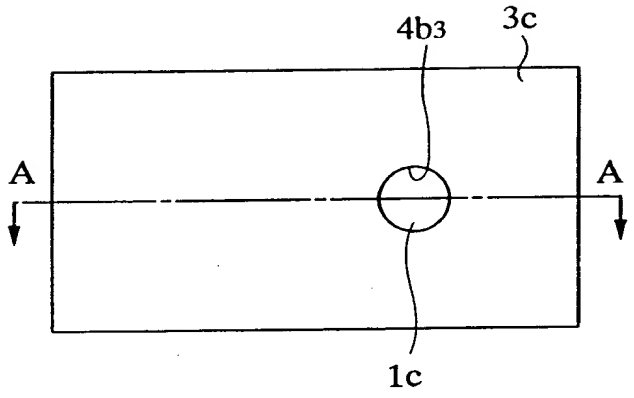
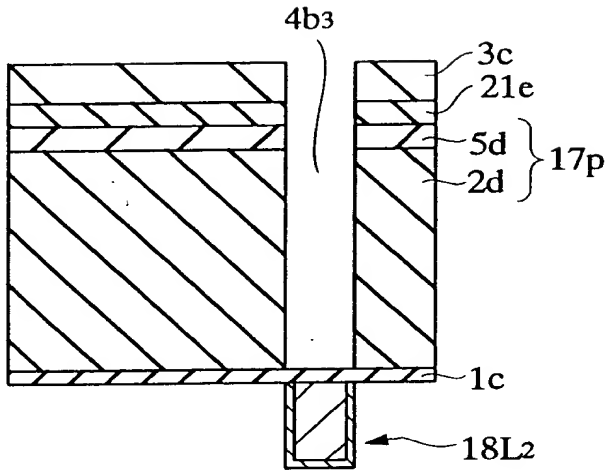


FIG. 87 (b)



~~FIG. 88~~

FIG. 88 (a)

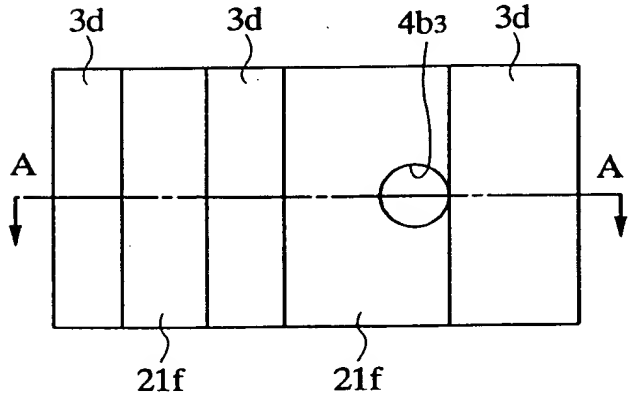
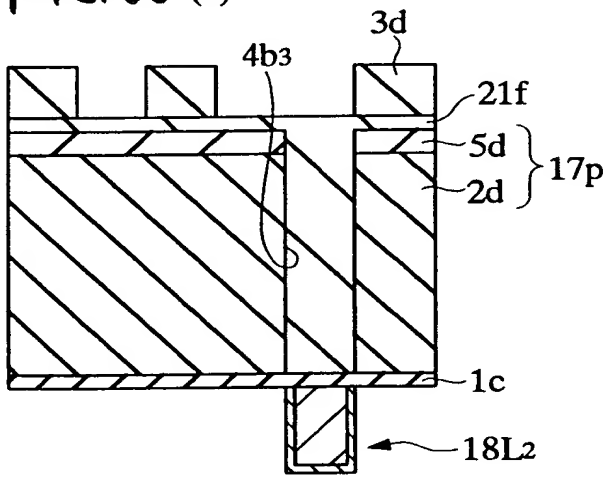


FIG. 88 (b)



~~FIG. 89~~

FIG. 89 (a)

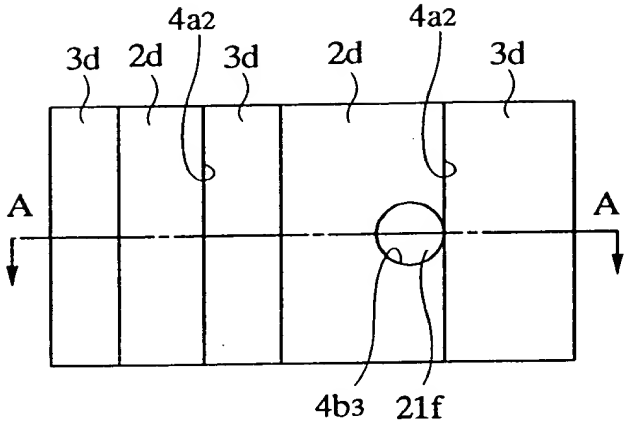
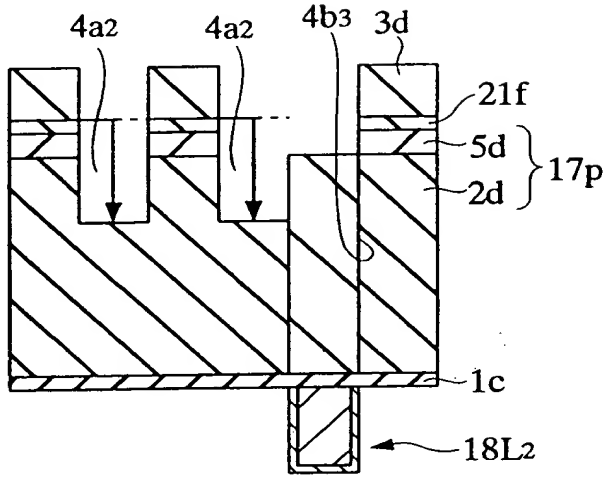


FIG. 89 (b)



~~FIG. 90~~

FIG. 90 (a)

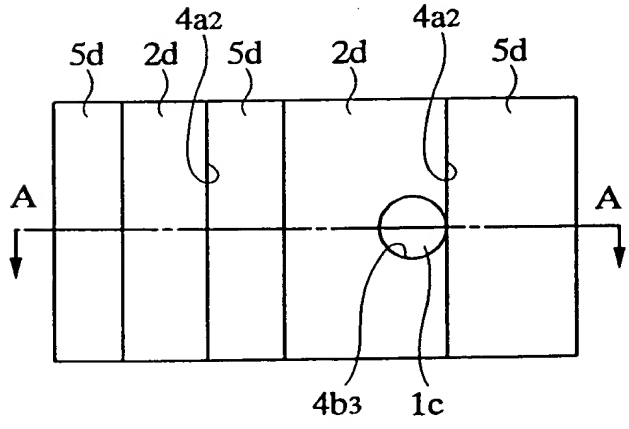
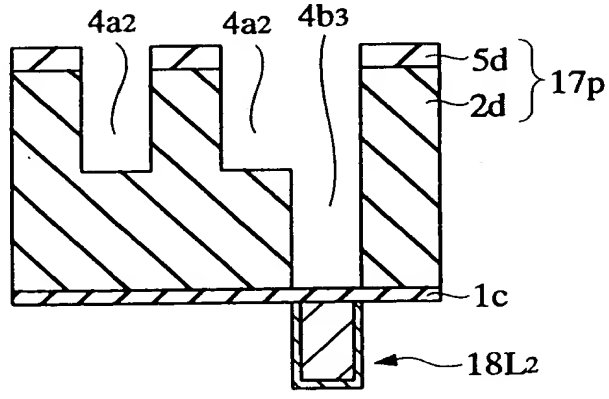


FIG. 90 (b)



~~FIG. 91~~

FIG. 91(a)

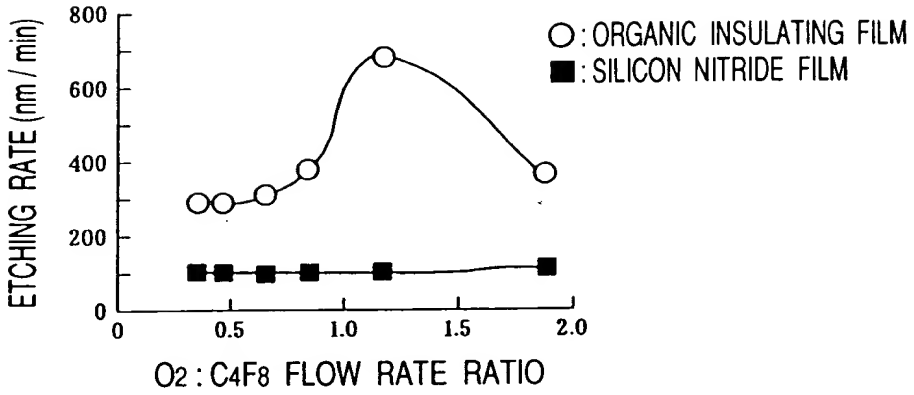


FIG. 91(b)

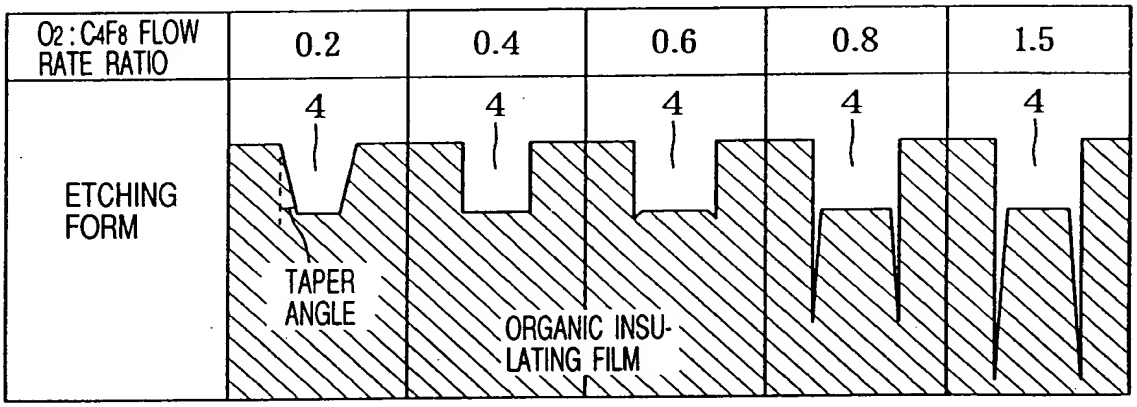
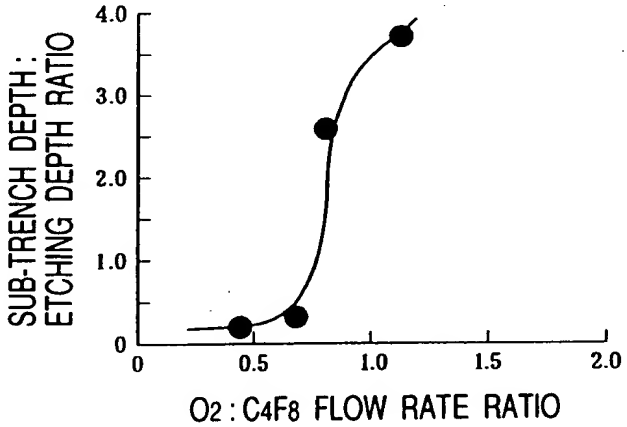


FIG. 91(c)



~~FIG. 92~~

FIG. 92(a)

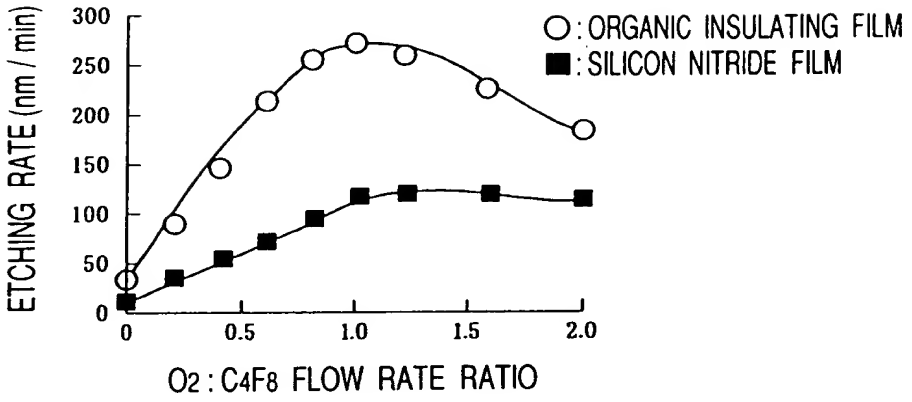


FIG. 92(b)

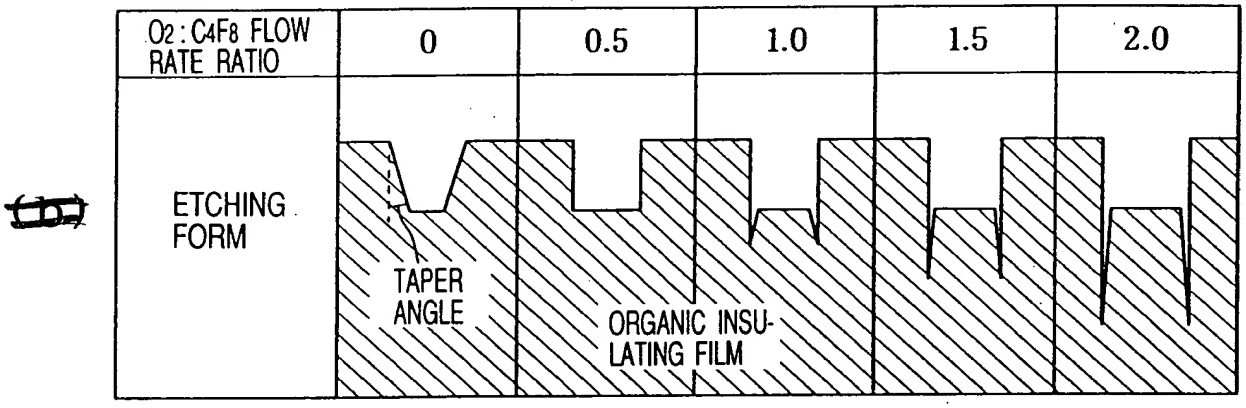
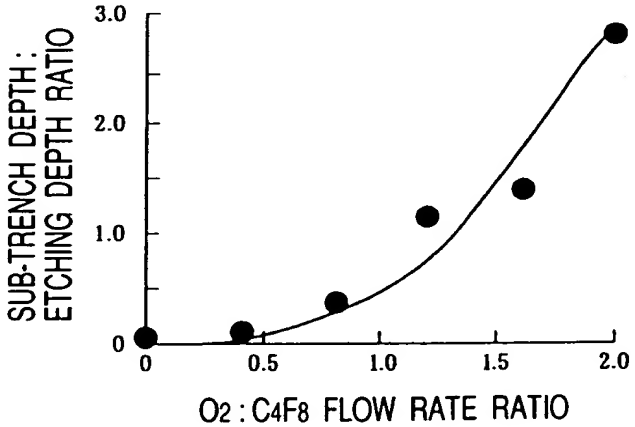


FIG. 92(c)



~~FIG. 93~~

FIG. 93 (a)

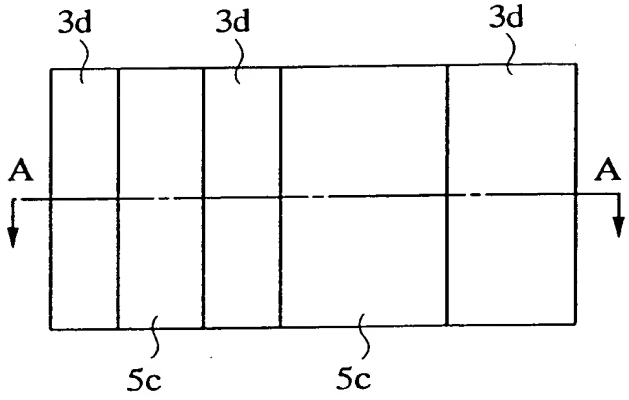
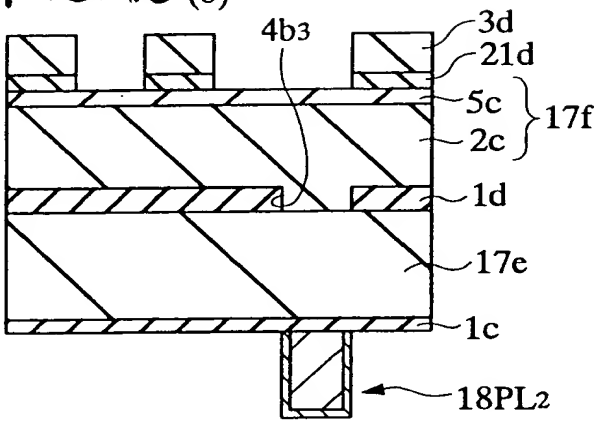


FIG. 93 (b)



~~FIG. 94~~

FIG. 94 (a)

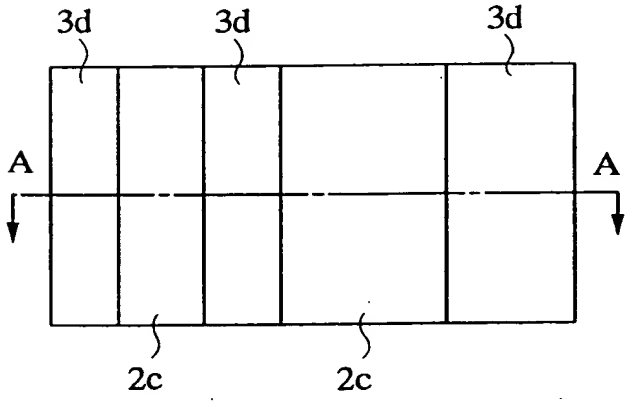
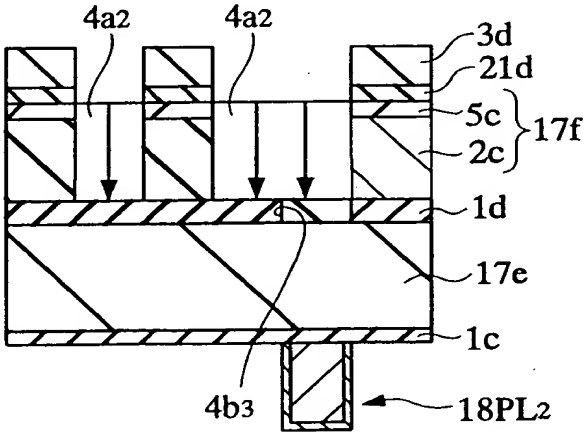


FIG. 94 (b)



~~FIG. 95~~

FIG. 95 (a)

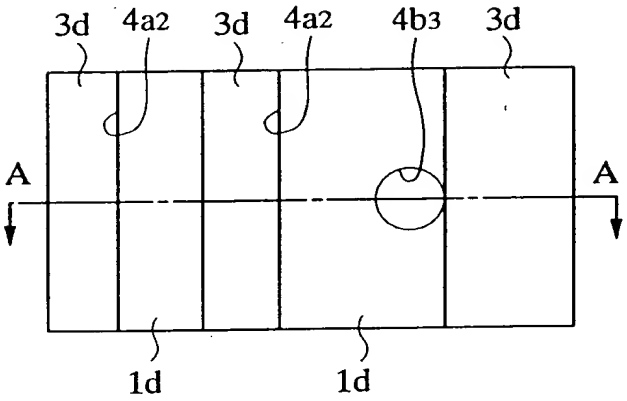
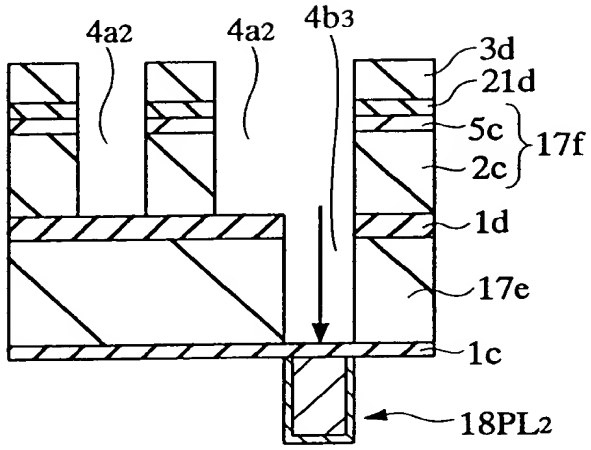


FIG. 95 (b)



~~FIG. 96~~

FIG. 96 (a)

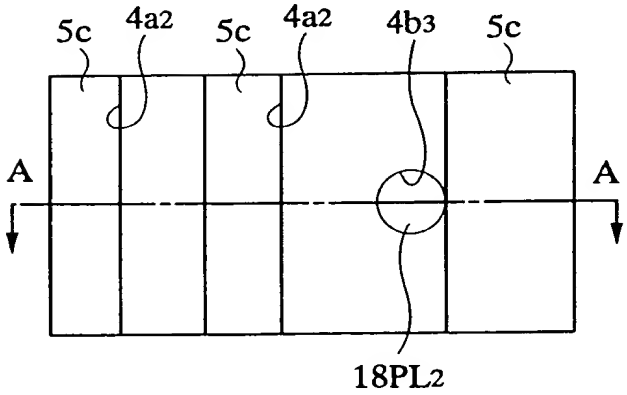
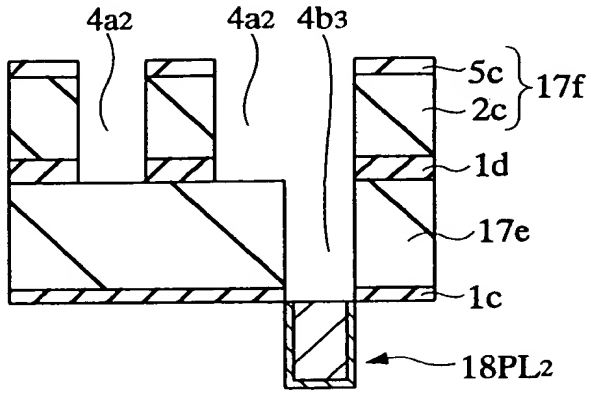


FIG. 96 (b)



~~FIG. 97~~

FIG. 97 (a)

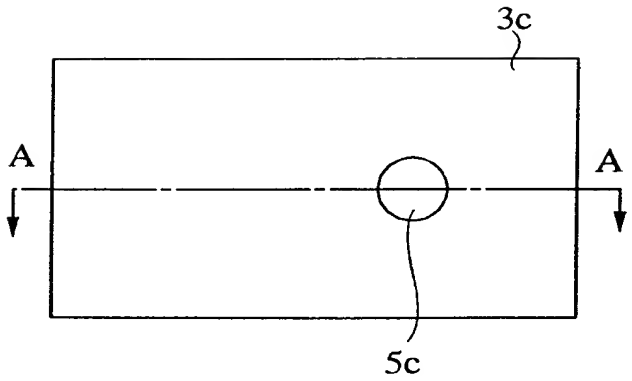
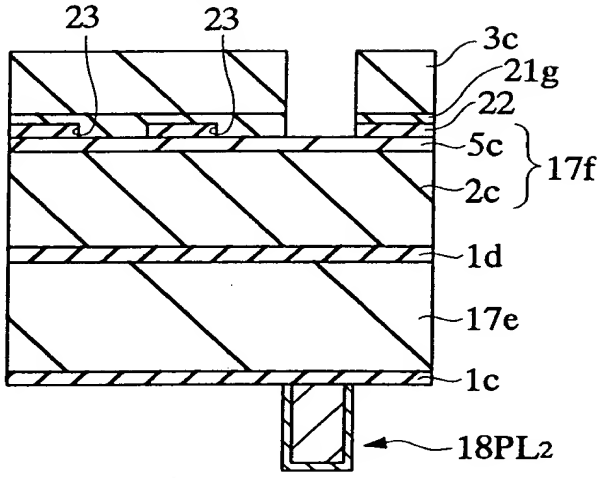


FIG. 97 (b)



~~FIG. 98~~

FIG. 98 (a)

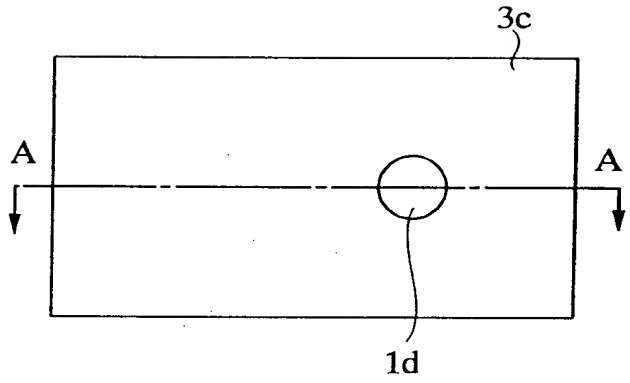
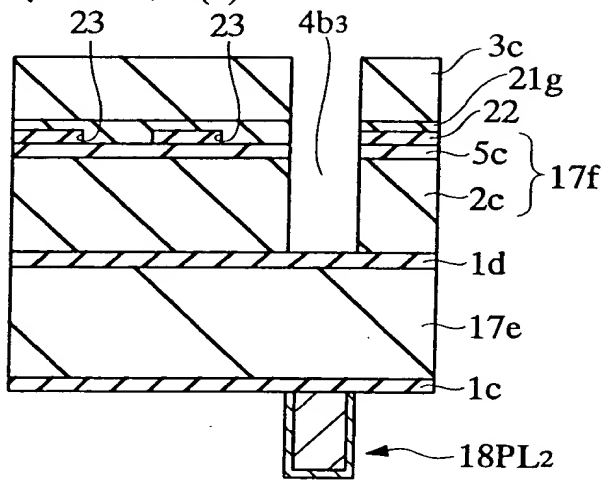


FIG. 98 (b)



~~FIG. 99~~

FIG. 99 (a)

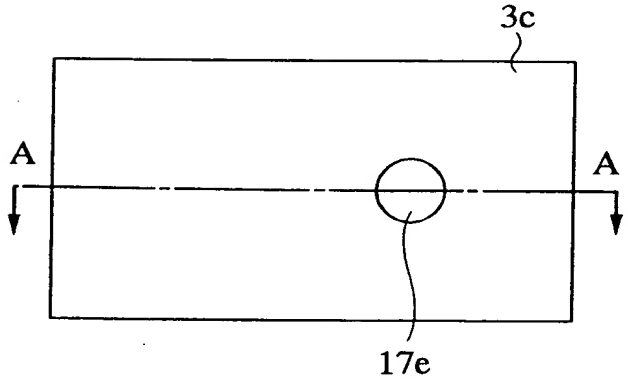
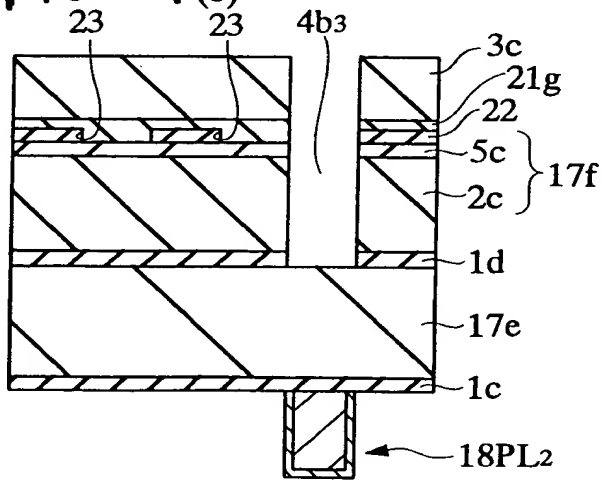


FIG. 99 (b)



~~FIG. 100~~

FIG. 100 (a)

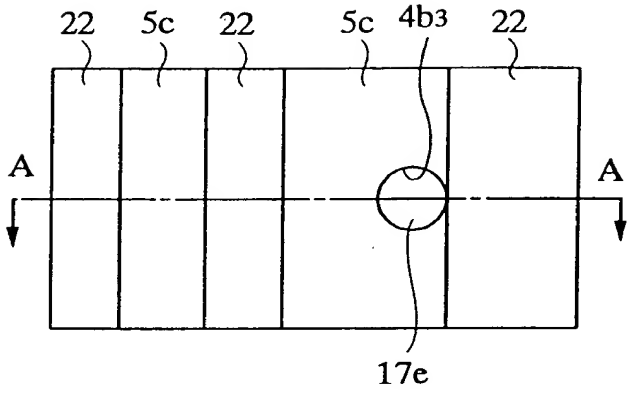
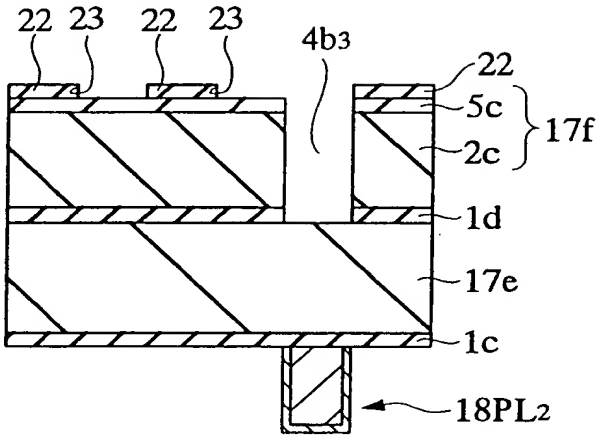


FIG. 100 (b)



~~FIG. 101~~

FIG. 101 (a)

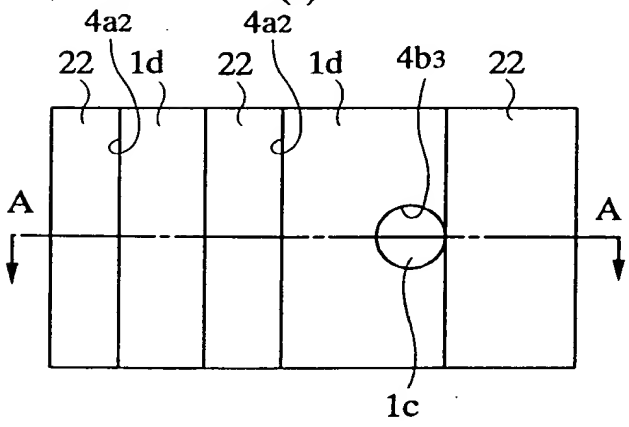
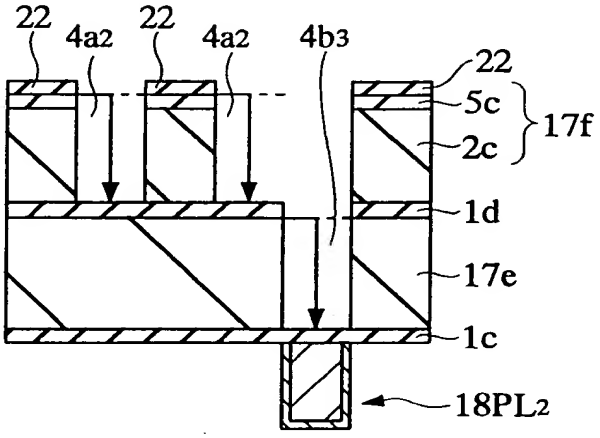


FIG. 101 (b)



~~FIG. 103~~

FIG. 103 (a)

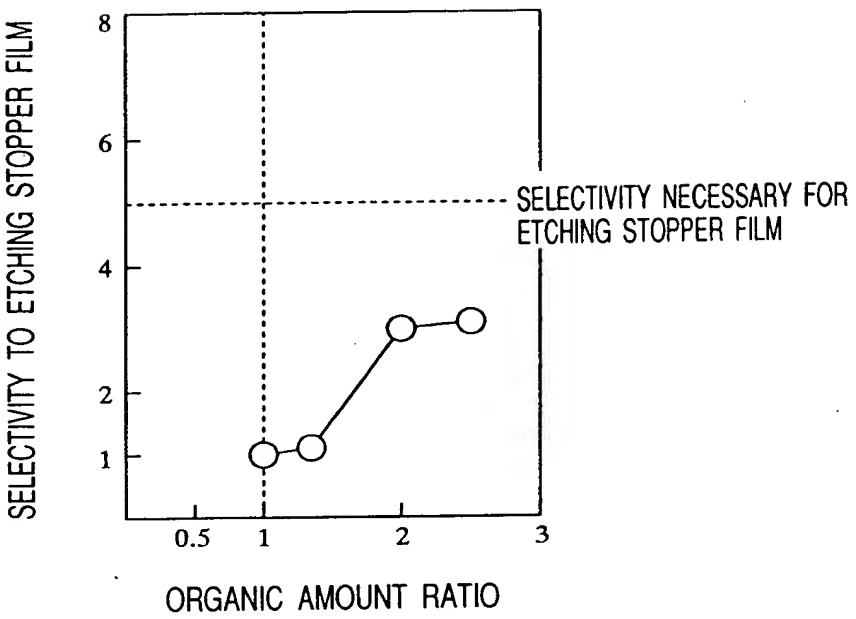


FIG. 103 (b)

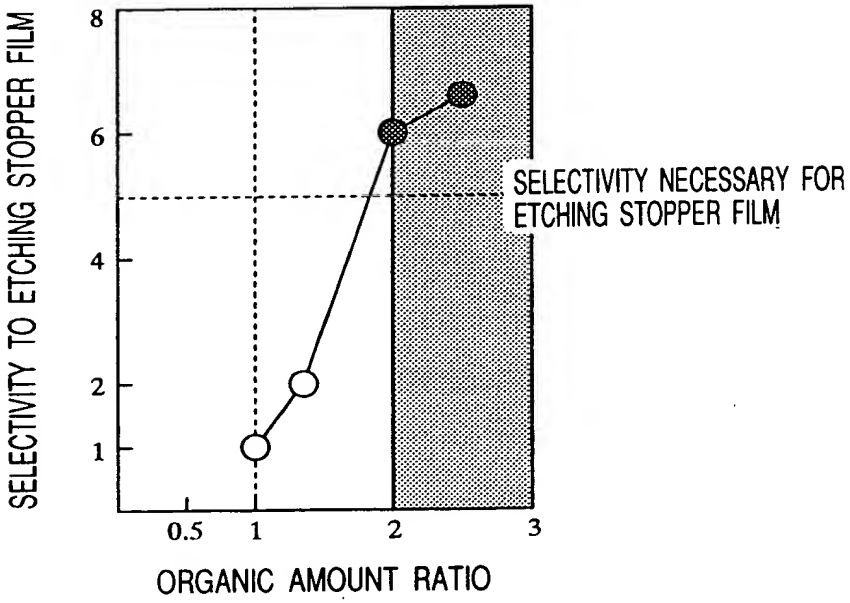


FIG. 104(a)

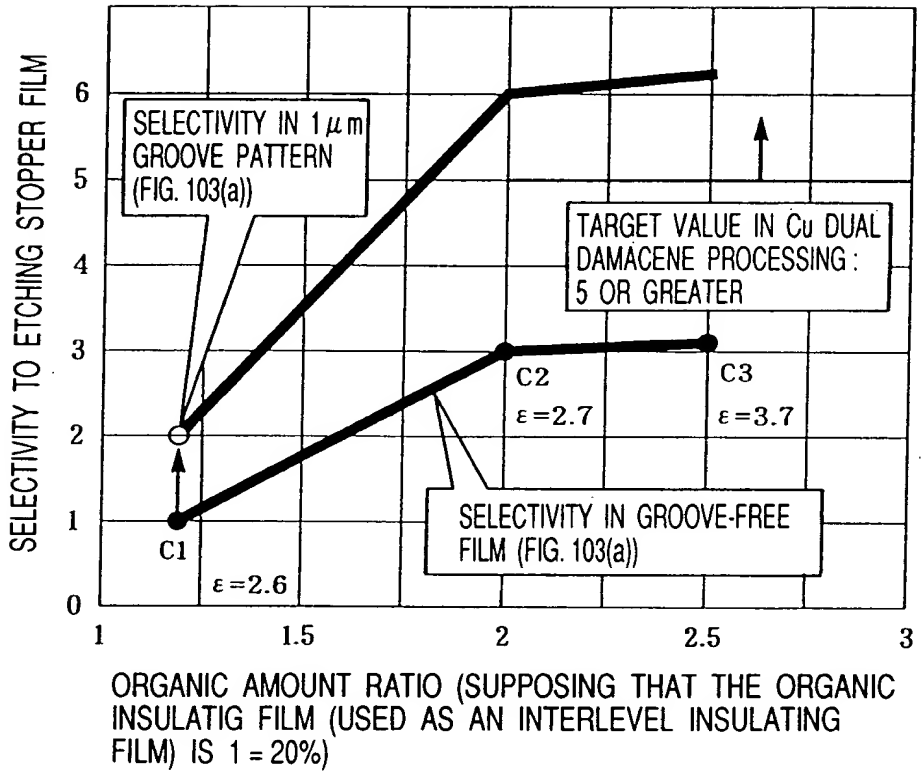
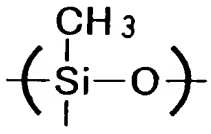


FIG. 104(b)

STRUCTURE OF C1



STRUCTURE OF C2, c3

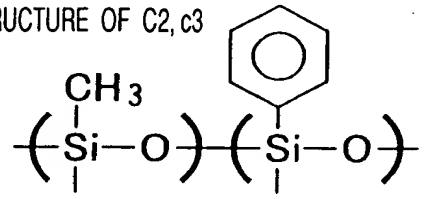
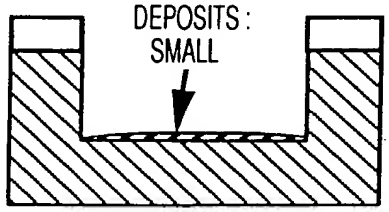
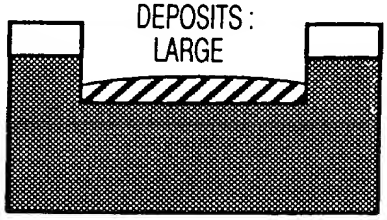


FIG. 108(a)

ORGANIC AMOUNT	CF CONSUMPTION RATE*	AMOUNT OF CF DEPOSITS	ETCHING RATE
SMALL (LARGE SiO CONTENT)	HIGH		HIGH
LARGE (SMALL SiO CONTENT)	LOW		LOW

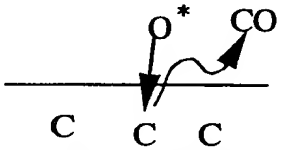
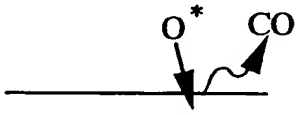
 SMALL ORGANIC AMOUNT	HIGH ETCHING RATE
 LARGE ORGANIC AMOUNT	LOW ETCHING RATE

FIG. 108(b)

~~FIG. 112~~

FIG. 112 (a)

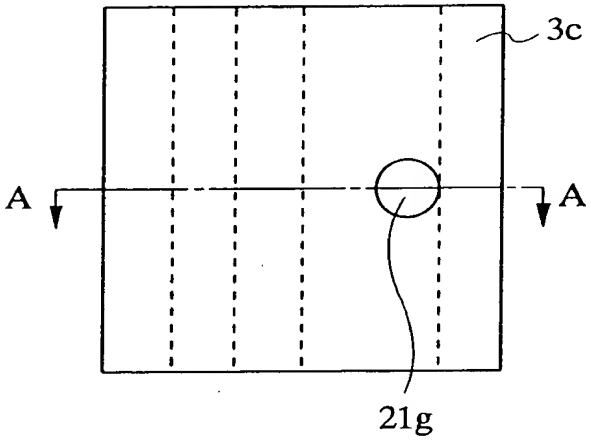
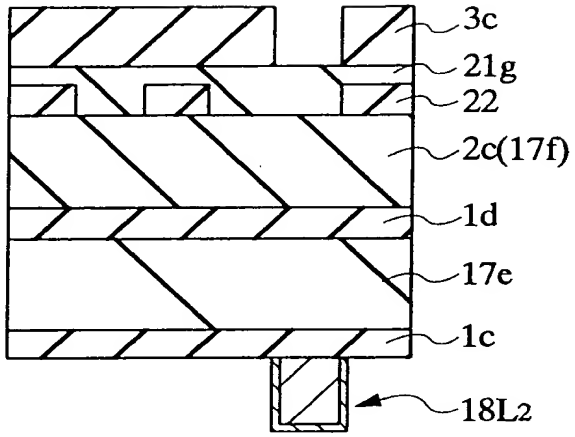


FIG. 112 (b)



~~FIG. 113~~

FIG. 113 (a)

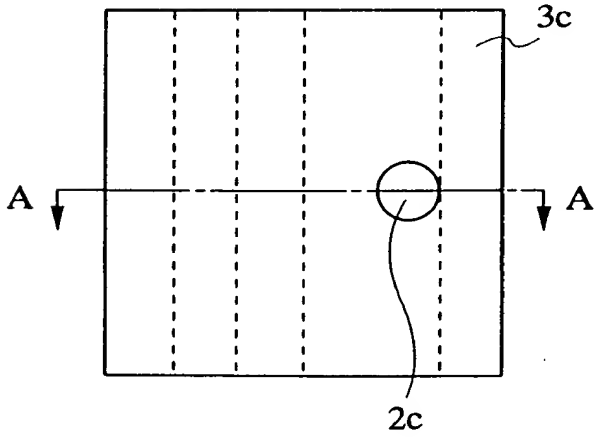
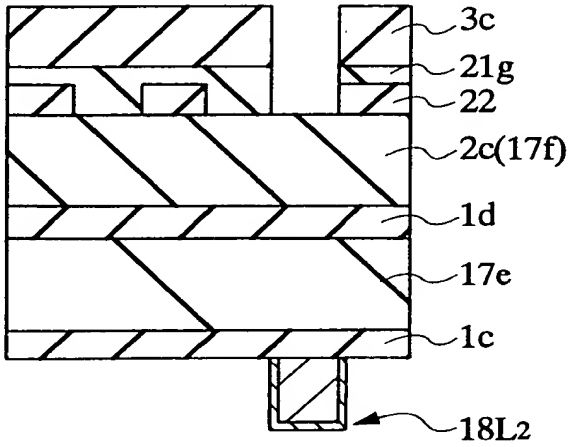


FIG. 113 (b)



~~FIG. 114~~

FIG. 114 (a)

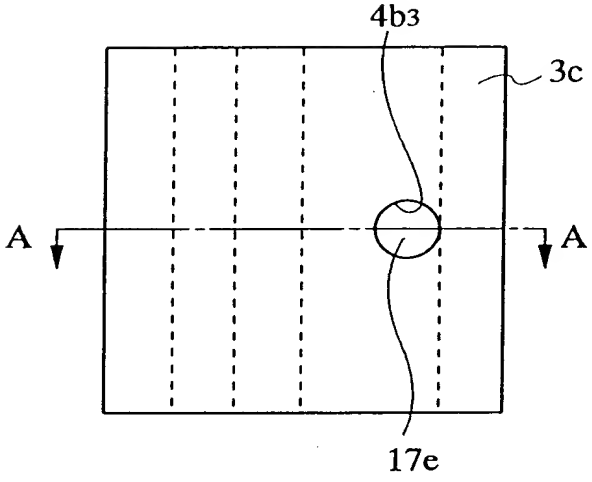
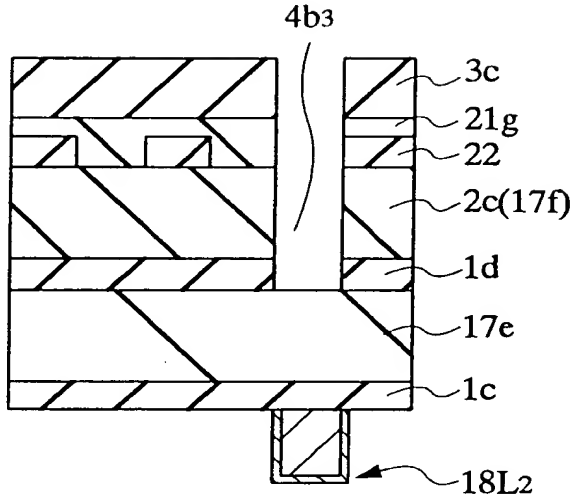


FIG. 114 (b)



~~FIG. 115~~

FIG. 115 (a)

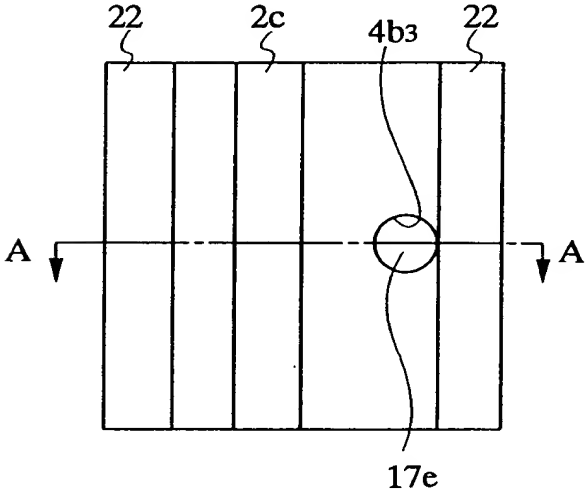
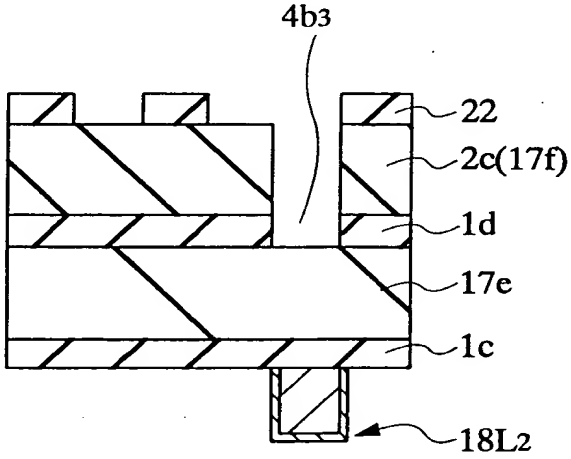


FIG. 115 (b)



~~FIG. 116~~

FIG. 116 (a)

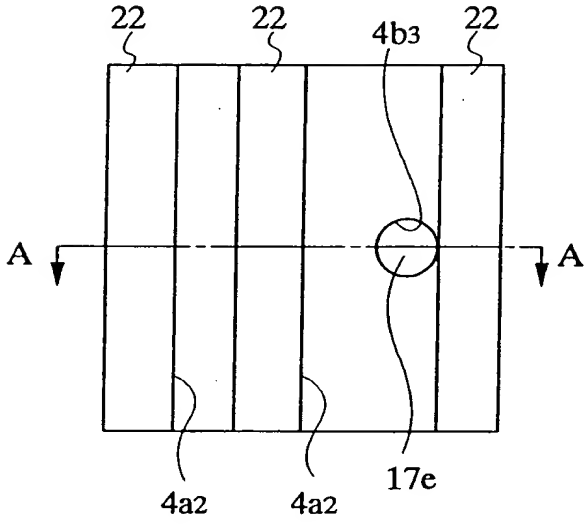
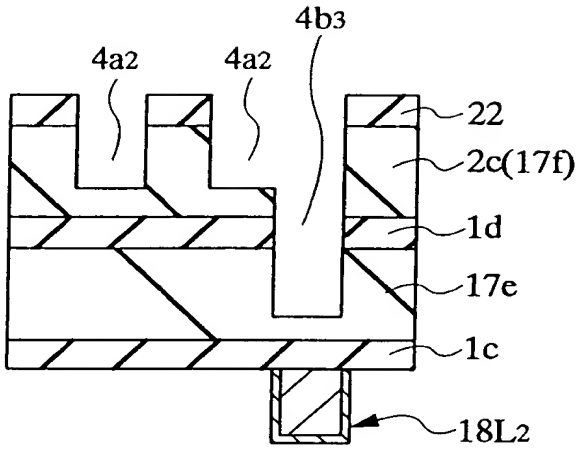


FIG. 116 (b)



~~FIG. 117~~

FIG. 117 (a)

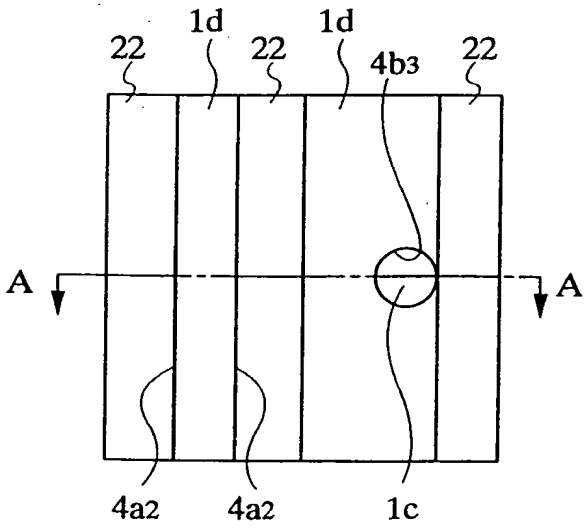


FIG. 117 (b)